
1922

THE

GOPHER PEAVEY

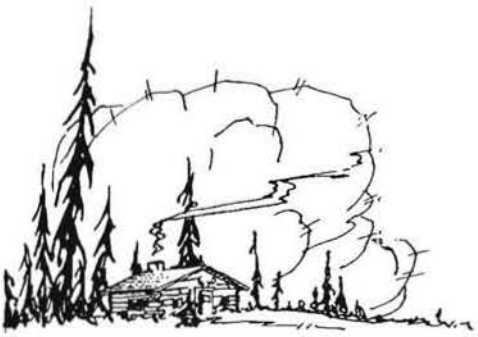
PUBLISHED ANNUALLY

BY

THE FORESTRY CLUB

OF THE

UNIVERSITY OF MINNESOTA



COMMENTS

By Arthur L. Nelson

OUR purpose in presenting this, the second issue of the Forestry Club annual, is to provide a medium through which the forestry student, the alumni, and the outside world may come in closer contact. We have endeavored to compile a truly representative book, depicting the progressiveness of the Club and embodying the spirit of Minnesota.

The 1920, or the first issue, was called "The Minnesota Forest School Annual." In casting about for a name, by which our annual was hereafter to be known, the Club chose the distinctive name GOPHER PEAVEY. Minnesota being everywhere known as the Gopher State, Gopher was therefore chosen, and the Peavey being the Club insignia, was chosen to distinguish our annual from the all University publication.

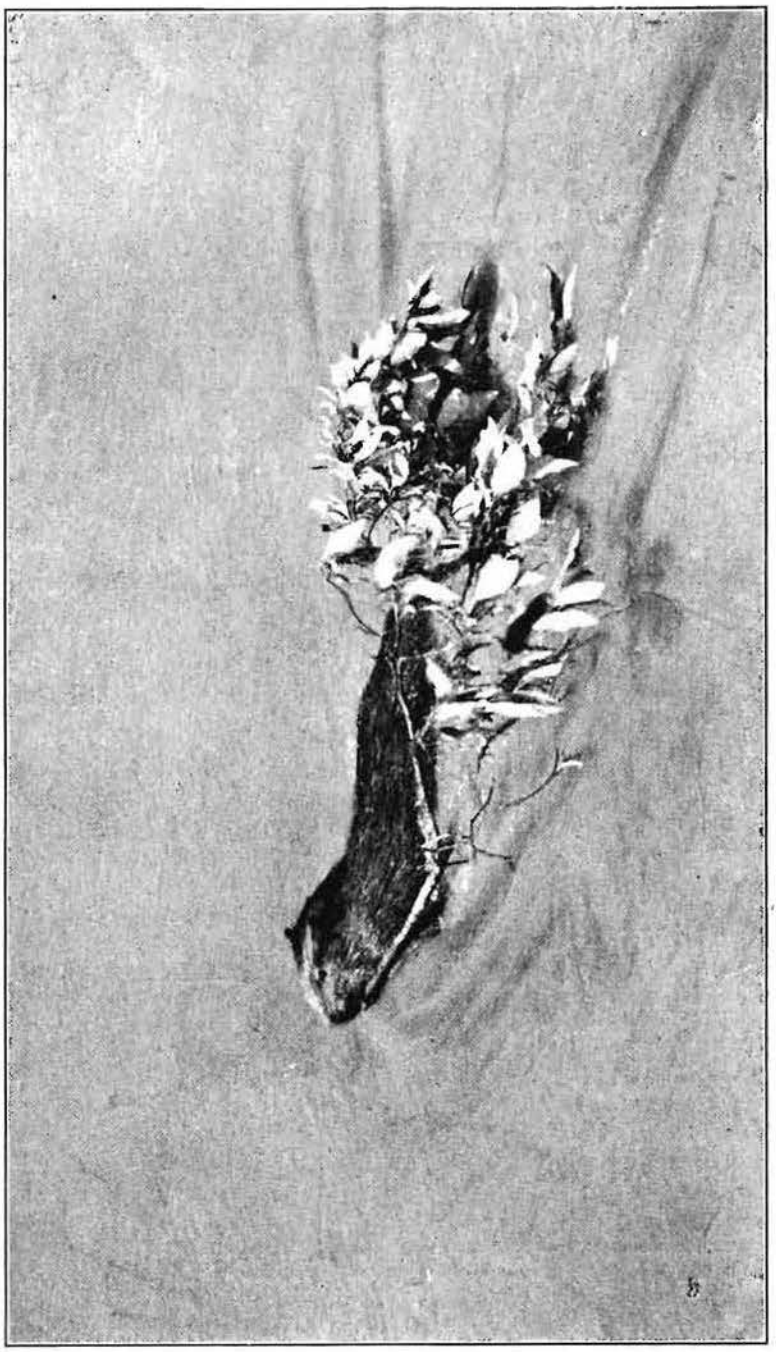
Without the assistance of those who contributed articles, this publication would not have been possible. May we take this opportunity to express our indebtedness to the authors.

Secondly, without the aid and co-operation of our advertisers, this book would have been an impossibility. In return, let us patronize them.

Our third indebtedness is to the Minnesota State Forest Service, Ski-U-Mah, and the Ten Thousand Lakes of Minnesota Association who have so kindly assisted us through the loan of many cuts.

Due to unexpected difficulties, last year's staff was unable to publish a book. The work in gathering material for publication, done by Mr. Albert Wackerman, has been of very great assistance to this year's staff.


The Warning
The burning forest smoke rose in the air
And shaped itself like vanished bison brown
Then hung as if it pondered, looking down
With massive head of shaggy curling hair,
Reflecting blazing pine trees all aglow,
As leaping flames sprang upward from below.
A moment stood and looking ever so,
It slowly drifted westward from the glare,
And rolling back came as a rumbling roar.
Like thunder miles away across the lea,
A sinister warning thru the sunset door,
Take heed! O profligates, Remember me,
For I am gone and shall return no more,
Think thou of those unborn that are to be.



BRINGING HOME THE BACON

THE GOPHER PEAVEY

VOL. II. 1922

ARTHUR L. NELSON
Editor-in-Chief

ORCUTT W. FROST
Art Editor

MAXON Y. PILLOW
Assistant Editor

J. WILL ADAMSON
Business Manager

CHARLES M. BROOKFIELD
Ass't Business Manager

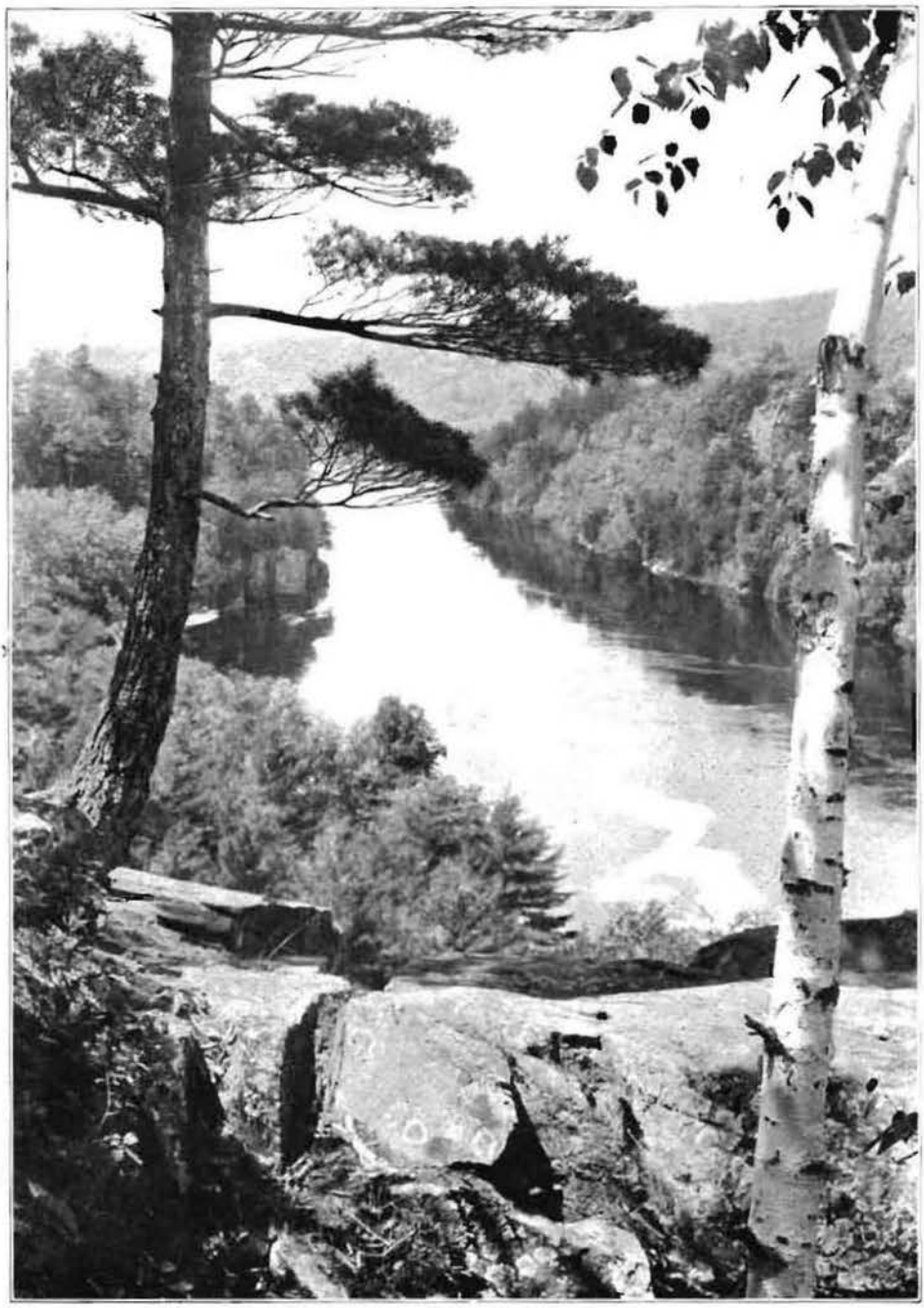
BOARD OF PUBLISHERS

C. O. CHRISTOPHERSON W. G. WILSON L. L. DEFLON

CONTENTS

FACULTY

E. G. CHEYNEY J. H. ALLISON
J. P. WENTLING T. S. HANSEN
G. H. WIGGIN L. L. DEFLON



THE NEED FOR SCIENCE IN FORESTRY

By J. V. Hoffman, M. F., Ph. D.

Forests require more than a human lifetime to grow. The best methods of handling the forest, through its long growing period, must be well worked out in advance in order to insure success and avoid costly methods. Our forestry practice must not be like a handsome structure for the public to admire, until, in the course of time, some one takes away the cornerstone and the edifice comes toppling down. To build scientific forestry solidly, it is necessary to know the underlying causes which control the life of growing things. When all the fundamental laws are clearly understood, then only does it become possible to say that such and such conditions and treatment of the forest lead to certain effects.

The recent rapid spread of the idea of applied forestry is the inevitable outcome of the lumber and grazing situations. The time has arrived when the effects of destructive lumbering have become a reality to the layman, and he is ready to support forestry development. The immediate public benefits derived from administrative regulations secure confidence in the Forest Service and make the forest an accepted part of the community and the nation. On the other hand, research reaches the public only in applied results and is removed from the immediate touch which gives recognition. A national research bureau, if it is to survive, must have popular support, and to obtain such support it must do some work that the majority of the people can understand or can recognize as being worth doing. Research cannot popularize all of the results; some should be written in the concise, accurate language of science; others may be made interesting to the general public. In this connection the bureau itself must not stifle scientific work to the point where only investigations that yield results of immediate application are encouraged or approved.

Very soon after the Forest Service was established, the need for facts upon which to build became apparent. To fill this need the Branch of Research was established, but the solution of the pressing, every-day problems of the administrator made a varied and crowded program for the investigator. These hurried investigations were mostly superficial, and conclusions were often drawn on observation and inference. One of the most important of the factors which have contributed to the advancement of research has been the formation of a central organization that is freed from the demands imposed upon it by those engaged in administrative work. This central organization, directed by the Washington Office, is the beginning of a group of technical men who will follow fundamental lines and be allowed to carry their investigations to a thorough, scientific conclusion.

Scientific forestry, on the whole, has profited by the good of each investigation; and in the long run it will not suffer from the bad, because time inexorably eliminates this. A superficial knowledge may be tem-

porarily satisfying, but eventually it must be replaced by fundamental fact if permanent progress is to result.

The limitations which are set on research in forestry often prohibit an early realization of the end sought and delay final results, even though the fundamentals are of vital importance. It is, therefore, essential that the worker in the applied science of forestry should see clearly the goal, however far ahead of immediate possibilities it may appear to be. Above all, it is essential that there should be a definite and inspiring program to lay before those who incline naturally to investigative work but who hesitate to elect forest research because of the limitations by which that field has hitherto been circumscribed.

The research worker in forestry need not concern himself with the specialized fields, such as proving the laws of genetics or establishing the principles of pathology, ecology, cytology, or morphology; but he must know the relations of each of these to his own problem and then depend on the specialists to establish the fundamental principles of their respective fields. A study of historical succession may involve paleobotany, but the forester need concern himself only with the present species and their behavior.

It is vital to forest research that it should attract young men of exceptional ability in the natural sciences, which is not likely to occur if the forest schools cannot conscientiously advise their most promising graduates to consider the Government service. The education of future scientific foresters can best be accomplished by co-operation with the forest schools. Close relations would bring the field viewpoint to the school and introduce more scientific methods in the field. Co-operation in research is necessary to progress, in order to eliminate that hypercritical rivalry which is so often evident and which is always more a hindrance than an aid to progress in science. Rather than make proverbs about glass houses, we should live in the open and work together in mutual understanding. The student should be given actual research, not stereotyped subjects, in order to arouse in him the initiative necessity for the advancement of science. The graduate too often leaves his university without having been introduced to research methods. He has no encouragement to follow any interest that may have been aroused in the field of investigations, and soon his interests are overshadowed by pressing administrative duties.

The extent of co-operation with the schools would depend on the policy of co-operation in scientific work, although it could be developed to a great extent with mutual benefit to the schools and the Government. The student would profit by the knowledge of forestry gained in the field, and the Forest Service would be able to determine his fitness for the work. With this co-operation begun in the junior or senior year, the student could take special training in his under-graduate and graduate work that would still further equip him. He would be encouraged to do this by an understanding that a position would be given him if he were willing to take up research as a life work. Specific training of this character would require special schools. One or more schools with proper

facilities could offer special courses, and the students planning on specializing would naturally attend schools prepared to handle the work.

In order to make possible the entrance of specially trained men into the Government service, a classified examination would be necessary. It is obviously unfair to subject a specially trained man to a general examination.

As forestry progresses, new problems arise that require technique and scientific methods for a successful attack. The system of merely cataloging facts or conclusions drawn from inference or observation is no longer adequate for the advancement of a permanent system of forestry. Special problems demand specially trained men, and it is essential that such men be given the best opportunities and conditions for work. The greatest interest and enthusiasm is aroused by following a specific line to its logical conclusion. The accepted principle in scientific fields which allows an investigator to work without competition should leave each investigator in his own field.

Advancement of scientific forestry depends on men trained in methods of research, whether in administrative or investigative positions. The limited amount of research undertaken within the Forest Service and the cry for the solution of forestry problems in botany, ecology, and the allied fields invite speculation as to the effect on the future research organization and its field. May not the absorption of scientific forestry by these groups be anticipated?

The interest of private owners is manifested in the funds set up by the Southern Pine Association to be expended by the National Research Council for forest investigations. The problems of the private owner must be solved, and the application of forestry on private lands will follow as a matter of course. It is true that the science of forestry is in the process of making, but so is every other science. There is no such thing as a completed science.

Permanence of results and clearness of scope must be strictly adhered to, and the natural development of the science will follow. Men will prepare themselves in proportion to the inducements offered, and forest research will progress in the degree to which it will be able to hold out a career in scientific work. In forest research we are leaving our boyhood behind; we are growing up, and the inevitable outcome is going to be the mastery of scientific forestry by means and for ends that are scientifically economic and, in the long run, unquestionably altruistic.

Bryan: "Look at the sawdust in my finger-nails."
Tilden: "Been scratching your head again, Dek!"

"DON'T TREAT THE FORESTS AS YOU TREATED ME"

A SLANT AT BRITISH FORESTRY

By A. O. Benson, '10

As a member of the A. E. F., I had the rare good fortune to be offered the opportunity to attend some British University. And you may be sure that I was not slow in accepting the offer. To think of being able to get away from the Rhine and the monotonous round of military duties and to be really doing something was almost more than one could hope for. All we were doing in the Rhineland was wishing for the word to pack up and hike for home. But this word was very slow in coming, so the chance to go to the British Isles was the next best bit of news.

At Camp Knotty Ash, at Liverpool, England, a considerable number of us graduates and undergraduates of American Universities congregated to get our assignments to British Colleges. Our stay at this camp was most instructive. In order that we might intelligently choose the schools we wished to attend, we were given lectures on the British Universities by men who were acquainted with the different schools and were able to set forth their strong and weak points. After sizing up the situation we were asked to state in order of preference five schools located anywhere in England, Scotland, Ireland, or Wales. The University of Edinburgh, Scotland, was my first choice, and I never had cause to regret it. I was assigned to that institution and spent four months in unadulterated pleasure as a student of that old school.

I had several motives in choosing the University of Edinburgh. First: I wished to further my knowledge of Forestry and I decided that there I could get the best there was in the United Kingdom. Next: I wanted to get to Scotland where are located the most extensive forests of the British Isles. Besides these I had several other reasons, not the least of which was that I wanted to get just as far as I possibly could from the Army of Occupation and yet not be out of bounds.

I registered for the summer term as a student of Forestry. Previous to the opening of the term I spent three weeks in the Highlands doing practical work with one of the Forestry classes. From these three weeks I believe I derived more benefit than from all the rest of the time spent in class and laboratory work. It put me directly in touch with the British student and I had the opportunity of doing real forest work as it is practised in Scotland. To get to know the Britisher and something of his way of thinking and doing was perhaps the primary object in sending us to the British Isles. And in no better way can you get to know a man than by getting out and using a pick and shovel along side of him and especially is this so when working in frozen ground, as was our lot for a while. About eight inches of frost will break a man's outside crust quicker than anything else. Inside this crust, I found the Britisher to be a thoroughly good fellow. Were it not for the three weeks which I spent

with these fellows in actual manual labor, I believe I would have left Edinburgh after a four months' stay with entirely the wrong impression of the university man.

The field work just mentioned was carried on on the large estate of the Duke of Atholl. This estate, with an acreage of 218,000, is typical of those owned by the British who have been favored by the Crown, with grants of land. Practically all of the British Isles is included in such estates. The government owns none to speak of. Of course the estate owner handles his lands as he pleases. Some practice forestry and some do not. But to see what is being done in forestry one has to go to one of these estates.

Along side of our forests the timbered areas of the British Isles are insignificant. On the other hand the practice of forestry is a very old one and they can show results which we cannot. The forested areas of Scotland, although more extensive than those of England or Ireland, are limited indeed. This was somewhat of a surprise for me. I had always supposed that Scotland with her Highlands had forests of no small extent, but not so. The forests of Scotland have suffered as far back as history records. In early times the wolves existed in great numbers in the forested Highlands and they did great damage to the farmer's flocks. So the forests were burned to get rid of the wolves. When Caesar in his campaigns invaded Scotland the Scots hid in the forests. So Caesar burned the forests to get rid of the Highlanders. Then along came Oliver Cromwell and part of his work of destruction was to burn the forests. And last, but not least, the Kaiser was the cause, in this last great conflict, of the sacrifice of some of the best of the remaining forests of Scotland. Britain drew heavily on Scotland for timber for the construction of cantonments and the many other uses that there were for timber incident to the carrying on of the war. Now Scotland finds herself practically destitute of timber and what makes matters worse, no national forest policy. This unhappy state of affairs is due principally to the unfortunate system of land ownership—the concentration of so much land in the hands of a few over which the government has no control.

Every one knows that a goodly supply of timber, home grown, means everything to a nation which is to progress. Britain now imports over 60 per cent of what she uses and this after the use of timber is cut right to the minimum. How to get the timber acreage which she needs is Britain's perplexing problem. The only resort is planting. On at least 95 per cent of the absolute forest land there is no chance to secure natural reproduction. So it is conceded by all that planting must be done. But by whom? With planting costs at about $25.00 per acre, no private individual is going to plant very extensively and the government can not force him to. How then to go about this planting job involving over one and one-half million acres of land? There have been various plans suggested, the best of which, I believe, is the one whereby the business of forestry would be conducted on a profit sharing basis by the government and the landowner. Under this plan the land owner would furnish the land and the government would plant and subsequently protect the

plantations. Of course this plan brought out great opposition from the non-land owners, who claimed that it would open up another means for the already rich man to graft some more. It will be interesting to watch the solution of this great national problem.

In connection with reforestation I just want to mention heather, the "bonnie, purple heather" of which one hears so much in song. Yes, there are miles and miles of this stuff in the Highlands, beautiful enough when in bloom and in reasonable quantities, but a curse when it covers the ground by the thousands of acres to the exclusion of everything else. In places it is almost impossible to make one's way through it. In some sections as far as the eye can reach the only vegetation to be seen is this worthless heather. And all this must be gotten rid of in some manner before the area can be planted.

Another trouble with British Forestry as it is practised at present is that it is too intimately tied up with game protection. There is continuous warfare between the forester and the game keeper. One of the main objects of the forests, in the estimation of the estate owners is their value as a cover for game. Game is surprisingly plentiful, especially rabbits and pheasants; so plentiful that plantations very often suffer seriously from the ravages of these two mentioned classes of game. To insure against destruction by rabbits it is very often necessary to fence with fine woven wire, entire plantations. This task alone costs about $25.00 per acre. These fences must be well constructed so as to prevent the rabbits from climbing over or burrowing underneath.

Hunting is the sport of a chosen few—the estate owner and his friends. No hunting grounds are open to the general public at any time. As a result, game holds its own and during the greater part of the season is absolutely unmolested. So much stress is placed upon the game feature of the hunting districts that rather than proving a blessing it has assumed the proportions of a curse to the development of the country.

Examples of good forestry are not hard to find, however. I saw as perfect plantations of Douglas Fir and Sitka Spruce as can be found anywhere. I saw one which was really remarkable. It was a one acre stand of twenty year old Douglas Fir. It was thinned during its tenth year. The returns from this thinning I was unable to get figures on. In its nineteenth year it was again thinned and the thinnings yielded about $100.00. After the thinning the stand was valued at $500.00. At that rate we could afford to go into private forestry.

One stand of Douglas Fir that I saw on the river Tay in Perthshire where trees fifty-five years old were forty-eight inches in diameter breast high with a total height of ninety feet. Another interesting sight was the logging of California Redwoods in the Highlands. In the more favorable situations this species makes splendid growth. Considering Scotland's rigorous climate it is surprising that such excellent results can be obtained with a tree, the natural home of which is California with an altogether different climate.

Now don't crowd, fellows, when I mention Lady Foresters. Yes, they had the real article employed in forest work. The ladies, a splendid

type of hardy, robust Highlanders, I saw in different places doing all sorts of work; transplanting, digging pits, clearing land, thinning young stands, and in fact doing practically any work that a man would do. And apparently they enjoyed it thoroughly. In most lines of work they were every bit as efficient as men and when it came to handling seedlings, sorting and bundling, they could beat a man with his clumsy hands, with no effort at all. They were dressed properly for the work; flannel shirts, Knickerbockers, high top boots. But it will do you no good to apply for work with these "wood nymphs." The crews of men and women work apart absolutely, usually at opposite ends of the estate. The overseers recognize the folly of trying to get any work done by mixed crews. Babbling brooks, shady nooks, springtime, a man and a maid, etc., etc.—you know the rest. Altogether it spells lost time. Men and women, engaged in the work, stayed at separate cottage camps and were transported to and from their work in motor lorries whenever the distance warranted it.

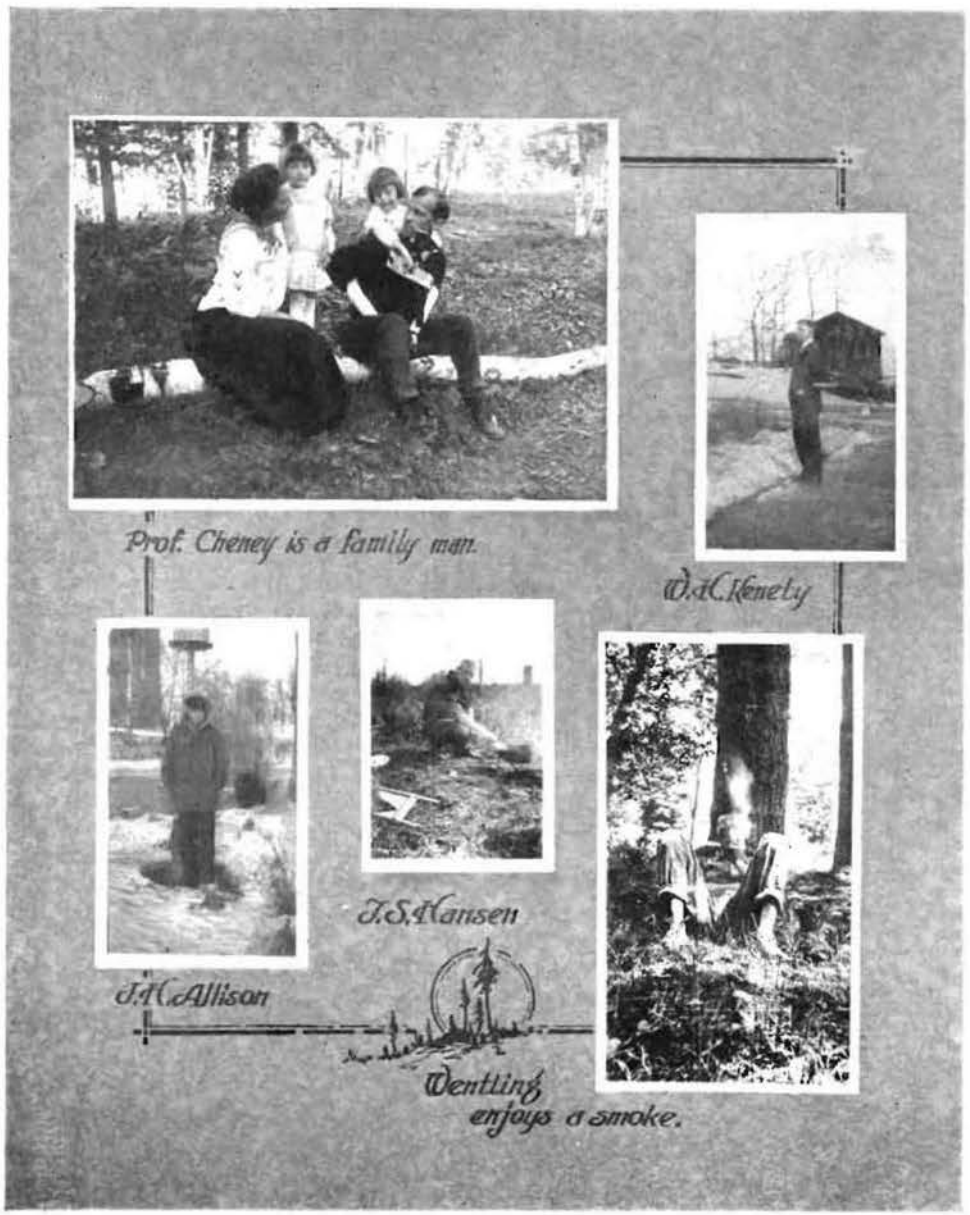
The work in the University was very similar to that in any American University. The course in Forestry covers practically the same subjects as the courses here and the classes are conducted in very much the same manner. The training of foresters has heretofore been very largely for service in India. They now realize that forestry on a more extensive scale is needed a little closer to home and they are trying to devise some scheme whereby they can put to work a few trained foresters. The estate foresters are seldom college trained men. They are men who have learned all they know about forestry in the school of experience. Some of them will spout scientific, pathological terms at you with the ease that such twisters flow from Doc. Freeman's nimble tongue.

I regret that I was not permitted to spend about a year in Scotland instead of four short months. I enjoyed every bit of it. Not the least of my pleasure came from every day association with the Scotch. They are fine, big hearted, whole souled, sociable people. They put themselves out to make us feel at home and after a few months in the Army of Occupation we were in the proper mood to take advantage of their hospitality.

At the close of the summer term the order to return to our organizations in Germany came, and it was like a kick in the face. However, it was only a step in the preparation for homegoing, so the cloud had a silver lining.

Nature loving "Savage" (On the way to the dining hall)—"Oh, wonderful oak, if you could speak, what would you say to me?"

Bright Sidney: "It would probably say, 'Pardon me but I am an elm'."



"OUR ARISTOCRACY"

TIMBER SALE ADMINISTRATION

RAYMOND ORR, U. S. F. S.

The ability to select good men and have them work *with* you in a loyal and energetic manner is to my mind the foundation or keystone **of** any organization. Without the correct organization any new policies which a Chief of Timber Sales may suggest or any old ones which must be enforced depend on the men under his supervision, for without perfect loyalty and harmony from his working force a one hundred per cent standard of efficiency can never be obtained and will vary from this standard according to the personnel which he has developed.

The question now naturally arises how should a superior officer obtain a one hundred per cent organization. There are many ways but only the ones which to me are the cardinal ones will be mentioned, and are as follows:

1. Have the men work *with you*, not for you.

2. Firmness and fairness in all of your dealings. A timber sale man who is not firm and fair not only does an injustice to his men but himself also.

3. Never ask your men to do something you would not be willing to do yourself.

4. In every organization, you will find men who are slow to comprehend detail, grasp the situation as it should be, or lack the necessary energy or initiative to go forward with the various phases of Timber Sale work. In such a case it is up to the Chief to judge this man carefully and reach a decision, fit or unfit for future work. If he is the former and has the necessary qualifications which must be brought out, that man is worth working with, and with the proper handling, if the Forest Officer's judgment is correct should develop into a very important part of the organization. Should he be judged unfit, he should be dropped immediately. Judging men is an exceptionally important factor in choosing your working force and it is the make or break of most every organization.

5. Now that you have judged the man as capable and he has all the earmarks of making an exceptionally good man, you cannot sit back and say, "He will take care of himself." We are all apt to get in a "rut," so to speak, and it takes constant supervision by the man in charge of sales not only talking with his men and discussing the various phases of the work, but working with them also. Theory and practice do not always go hand in hand and often a superior officer has lost the confidence of his men by telling them to do something which, when they tried to carry it out found that it was impossible or they were given insufficient time. In other words he should clearly outline in his own mind the details of a certain task to be performed by his force, determining each phase pro and con, and not issue an order on generalities or on a hasty decision.

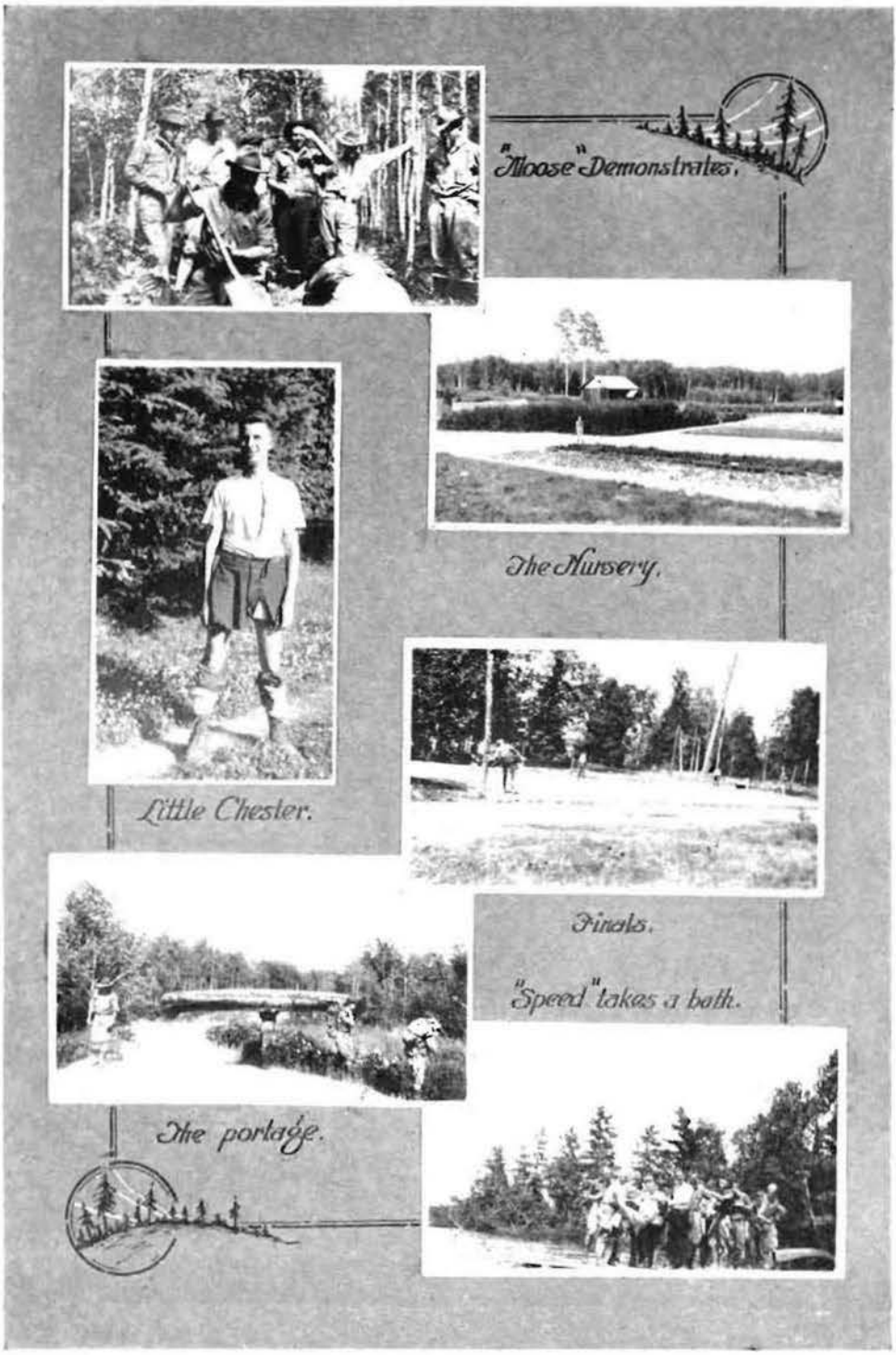
6. Careful planning of each day's work should be strongly emphasized and the supervising officer should devote constant attention to this by going over a man's work and plans and in aiding him by discussion, etc., how he could have improved his work, accomplished it in less time and more efficiently. For example, I have noticed instances of a man using his Ford instead of his brain. He starts out on a trip without any clear definite plan of how to accomplish the most in a given length of time, and the thought when he started which was uppermost in his mind was, "Well, if I overlook some part of my work on this trip I can jump in the Ford and do it tomorrow or next week." There are many instances along this same line and others where constant supervision and being at all times on the job can be remedied and improved.

7. Never give an order which you would not carry out yourself. All of us no doubt have been told to do a certain thing in a certain way by a superior officer and the first thing that comes to one's mind is. "Does he practice what he preaches," you naturally watch and if he carried out his own instructions, your respect and loyalty to him increases, but should the opposite be true it has a very decided effect in the other direction. When one has a good personnel to work with him on Timber Sales the supervision is comparatively easy, but the man in charge of sales must be constantly on the job to keep his organization up to standard. It is not the big things that count on timber sales, but the small ones. The big problems are easily solved, but it takes good judgment, diplomacy and firmness to handle the small ones, for while they do not at first thought seem to be of enough importance to bother with in the end if you let them slide they have a very important bearing on the larger problems.

In timber sale administration the following are very important subjects to consider when dealing with the operator.

1. Be firm and fair.
2. Never make a hasty decision, which later you may have to recall.
3. Treat every operator the same, in regard to contract, etc.
4. Attend strictly to your own business and never by word or action give the operator a chance to think you are meddling in his private affairs.
5. Make your timber sale administration steady and constant. It is better to inspect a sale even though you know everything is all right, than to let the operator think you are satisfied with his past showing.
6. Give all the supervision you possibly can at the beginning of the operating season. The supervision you give at that time will have its effect for the remainder of the year.
7. Never let the operator get behind in his contract. You not only do yourself an injustice but the operator as well.

In concluding, I might say that there are many other points which experience alone will teach one; but if a man is always on the alert and studying carefully all his problems in an unbiased manner, timber sale administration will be work, which, to my mind, is the best and most interesting the Forest Service has to offer.


"Moose" Demonstrates.
The Nursery.
Little Chester.
Finals.
"Speed" takes a bath.
The portage.

"THE HOBO FORESTER"

I sometimes think I'll quit this life
And settle down and get a wife, By Jove,
Sometimes I think that I would love
To have some place I could call home
And settle down no more to roam.
But Hell! that very thing I've tried
And found myself dissatisfied.
I've often tried to settle down
To office work, and live in town
And act like civilized folk do,
Take in shows and dances too.
But I'd no more than get a start
When "Wanderlust" would seize my heart,
The Great White Silence calling me
And at the chance I'd never fail
To drop it all and hit the trail
Back to the solitudes again.
With transit, level, rod, and chain
And do the same thing o'er again
Day after day and week after week.
Sometimes we go to town to seek
A little fun and sometimes, well—
Sometimes we raise a little Hell.
WE don't mean to, but then you see
When we've been out two months, or three,
In silent places, where the face
Of white men seems quite out of place.
Well! when we hit the "Great White Way"
Our joyful spirits get full sway.
WE try to crowd into one nite
The joys of months, it isn't right.
Well, maybe not. 'Tis not for me
To shape our final destiny.
But when our last "Forest Survey" is done
And 'tied into the great unknown,
And to the Chief our records brought
Of lonely work, and danger fraught,
Of hardships cheerfully endured,
That best results might be secured:
Against all these our little sprees
Will seem as ponds compared to seas.
And the Angel surely will decide
There's a balance on the credit side
And God, I think, will shed a tear
And bless the "HOBO FORESTER."

With apologies to Mr. Douglas Mallveh.

TRENCHING A PEAT FIRE

THE EFFECTS OF FOREST FIRES

AIRPLANE FOREST FIRE PATROL IN CALIFORNIA, 1920

R. L. Deering, U. S. F. S.

Through co-operation with the Air Service and Signal Corps of the Army, the United States Forest Service was able to use airplanes for fire patrol over the National Forests in California during the season of 1920. The idea was not to do away with the special lookout and patrol force which the Service had built up, but rather to supplement their services by every available means that could be used to give closer protection. The Air Service furnished all of the planes and pilots; the Signal Corps the ground wireless equipment; and the Forest Service a few civilian observers, together with the field force to handle the fires after they were discovered and reported.

As a preliminary, a conference or school was held in the spring of 1920 for a month for the Air Service personnel which was to handle the work and the Forest Rangers who were to act as liaison officers at the different bases. Such matters as the Theory and Practice of Flying, Radio Communication, Maps and Map Reading, Forest Fire Protection, and many other allied subjects were studied.

Bases were established at four places scattered over the State from which nine aerial patrols went out each day over the National Forests, covering the areas of greatest fire danger. The patrolling ships were expected to follow regular routes, identified by prominent topographical features at each turning point, only deviating from these if fires were discovered which they wished to "circle" to get a better description to report. The length of the routes in time was about two hours from the start to the landing places. This meant that the ships would leave the base and travel for two hours to the end of the route. The men would then eat lunch and go back after noon over substantially the same route to the starting point.

Maps on a scale of four miles to the inch were supplied to the observers. These contained the main topographic features of the country and showed the route of the patrol. They were cut up into sections about 14x20 inches in size and were mounted on stiff board with the next following section on the back of each. Since land lines were not shown, the maps were "gridironed" into two-mile squares which were given co-ordinates by which to report and similar maps in the Forest offices made the translating of the figures easy.

The work was organized sufficiently early so that the Air Service personnel was on duty May 1 or about a month before the active fire season opened on the Forests. This made it possible to get the rough edges worked off so that the organization was in shape to function when needed. The work closed in all except Southern California on September 30, when good rains came and the fire season was practically at an end.

The type of plane used was the De Haviland and when it is considered that emergency landing fields in the Forests are anything but numerous, while the conditions of flying over jagged mountain ranges are not of the best, the showing of this type of plane was extremely good. It also was necessary to have planes that were large enough to carry two men, one to act as an observer and the other as a pilot to handle the work to advantage and for this reason the De Havilands were the best type available.

The machines traveled at an average speed of about 100 miles per hour when on patrol and during the season a total of 1,118 flights was made with 388,820 miles covered. The flying time was 3,262 hours. In all, there were but thirty-six forced landings as the result of which there were only three fatalities, all of these coming from the falling of a ship in Alturas, California, where the occupants—the regular crew and an extra observer—were burned to death when their machine fell to the ground because of motor trouble.

During the season, the airplanes discovered and reported 772 fires, most of which were in the National Forest areas. A relatively small percentage of those inside the Forests was reported by the Air Service prior to the receipt of any report from the Forest Service lookouts.

In the interest of prompt reporting, the planes were equipped with wireless telegraph equipment in order that the fires might be reported immediately upon discovery by radio rather than to wait until a landing was made at the bases. Had the wireless worked properly at all times, great rapidity in reporting would have resulted, but unfortunately the equipment was not entirely satisfactory.

To test the correctness of location of the reports which is, of course, the other vital factor, a check was kept which showed an accuracy average of 77 per cent for the season. The scale used in figuring this out was to credit a perfect score for all fires found burning within one-quarter of a mile of the reported location; 75 per cent for each within one-half mile; 50 per cent within one mile; 25 per cent within two miles; and no credit if over this distance.

Aside from the value of airplanes as a general fire detection agency, which results have proved, very naturally, is not as great as that of the permanent lookouts, whose hours of vision over any given area are much longer, there are several fields in which the airplane stands out as capable of rendering vitally important services in fire protection.

One of these points is the tremendous worth of the air machines for making special reconnaissance flights over large fires that are burning. On several big fires, during the past year, the man in charge of the crews made a flight over the entire area and got information in a few moments which he could have secured in no other way in less than two or three days. This was of immense value in planning the suppression work.

Considerable use was also made of the planes in transporting experienced crew leaders from one part of the State to another when a serious emergency broke which required more capable fire chiefs than the Forest on which the large fires were raging was able to supply.

There is one other value from the Service viewpoint which must not be overlooked, and that is the publicity and psychological effect on the people in the country which the daily passage of the planes overhead has. It is a constant reminder of the need for care with fire in the mountains which must be realized by all persons using the Forests if the man-caused fire peril is to be lessened.

The Air Service has found that the Forest patrol has been the best kind of training for its men and it has given them a very definite object on which to work with the added stimulus that the operations are as similar to the scouting work in actual warfare as can be found in times of peace.

It is hoped to continue this work and try to improve its efficiency during the coming year in three of the Forest Service Districts. It has its place in fire protection as a supplement to the established protection system and for special work which, by the nature of things, airplanes only can fulfill.

THE FORESTRY GUY

By Arthur Chapman

A knightly figure amid the green.
In khaki instead of mail,
A face of bronze, eyes quick and keen—
Swift hoofbeats on the trail;
A home in the saddle through summer days,
A bed 'neath the evening sky;
Who is it that travels the silent ways?
He's only a forestry guy.

A camp on the heights, where the snow banks gleam;
A pack-horse that's grazing near;
No sound save the sound of the mountain stream—
The town sends no echo here;
A figure bathed in the sunset's fires;
Who dwells on these peaks so high?
Who travels amid these granite spires?
He's only a forestry guy.

A tendril of smoke in the valley wide,
A flame that is fanned by the breeze;
A break neck dash down the mountain side
And a fight for the living trees;
A fight that is won, though the price is dear:
There are scars ere the red flames die;
Who is it that dices with death each year?
He's only a forestry guy.

—American Forestry.

SUPERIOR NATIONAL FOREST, ELY, MINN.

1. Rapids North Kawishiwi River
2. Upper Falls of the Kawishiwi River
3. Lake Gabro

SUPERIOR NATIONAL FOREST. ELY, MINN.

1. Falls of Isabella River
2. On the Kawishiwi River
3. Gabro Lake

FOREST SERVICE SIDELIGHTS

By Leo A. Isaac, Forest Assistant, U. S. F. S.

After a friendly greeting from the supervisor and meeting the office force, you proceed to get acquainted with the records, files, forms and service ways of doing business.

In a short time you are issued a brass badge (U. S. F. S. Shield) and when it is pinned on your shirt pocket your chest just seems to fill all the vacant space in an O. D. shirt. The supervisor suggests that you visit the nearest timber sale area out on LOUP LOUP CREEK and see how the operation is progressing. You stroll out there with the air of a Minneapolis traffic cop but hesitate long enough to exchange a word with a "bolshevik" lumber piler in the rear of the mill and learn to your surprise that a good lumber piler makes about three dollars a day more than the Forest Assistant. The shock is so great that you come down to earth, seek the nearest lumber pile and in its friendly shelter proceed to pin the badge under the flap on your shirt pocket and the work of a Forest Assistant is begun.

The forest assistant is "supposed" to be the technical man on the forest but in fact his duties are divided about equally between administrative, technical, and just plain work. It is not at all uncommon to be sent out to explain something to a ranger and assist him with something about which you yourself know nothing but must first dig it out of the forest service bible (manual).

When a fire gets big and dangerous it is considered a good plan to send the forest assistant in to see how things are going and you may find yourself starting up a timbered canyon with a crew to find a fire somewhere near the headwaters. The crew seem to think you know what you are doing but you are sure that you don't and in a few minutes you find yourself and crew behind some friendly rocks in the creek-bottom in a mad contest to see who is the most successful in keeping a wet handkerchief tied over his nose and mouth, with a crown fire going down the canyon twenty miles an hour and roaring like a thousand freight trains.

Some hunter may be careless enough to come out without a match, compass, map, or sense of direction and get your quiet mountains all excited and out of place and you find yourself weary and hungry but hot on his trail down snow clad slopes covered with rocks and windfalls into the muggy canyons where the snow is wet and soft, then up again and out of the fog into the icy-aired summits where the cold high altitude winds penetrate to the bone, but you find him and push the streams and mountains back into place and to your surprise the fellow wasn't lost at all—just a little bewildered.

The next thing that comes to your attention will be some poor misguided creature with a family who has come out to hew a homestead from the wilderness. It becomes your solemn and arduous duty to convince him that it is impossible to make good agricultural land from an area of solid rock with a few scattered trees on it.

To run the survey of that new trail took just a day too long to get back to town in time to take the new school teacher to the dance and there wasn't even a telephone in the vicinity that you might extend the courtesy of breaking the date.

But color those pictures with a friendly smile of a lot of good fellows; an evening in a mountain meadow with a tiny stream gurgling by and a maze of snow clad peaks, forested slopes and deep canyons every way you look; a rushing mountain stream with deep pools where the rainbow trout are jumping crazy for the fly; crawl out on a crisp morning with you little "hi-power" and drag a four-prong buck down over slope and be back to the ranger station with the heart and liver in time for breakfast; during the tourist season let "a fairy from out of the east" drift in and it immediately becomes the forest officer's duty to explain everything in minute detail; then back to headquarters and the cheerful "hello" of the supervisor, who is pure gold as a man and faultless to work under. Boys, the life of a forest assistant would come pretty close to the forester's dream if we could only persuade congress to loosen up a little on the salaries.

Little drops of water
That we used to think,
Were simply made for chasers,
Are now the whole blame drink.

THE LITTLE SAGANAGA—SUPERIOR NATIONAL FOREST

SUPERIOR NATIONAL FOREST, ELY, MINN.

1. Camp on an Island in Lake Insula
2. Camp on Basswood Lake
3. Camp on Island in River above Fernberg

BEMIDJI, MINNESOTA

2. Lake Plantagenet

. Moonlight, Lake Bemidji

3. Old Logging Road Through Pines

THE FOREST SUPERVISOR

F. W. CLEATOR, U. S. F. S.

There are many in the Forest Service and out of it who think that the supervisor has the best job that the service has to offer. I am inclined to think that this is right, but the path of roses strewn for the supervisor contains many a hidden boulder and root for him to stumble over and frequent cobwebs to get into his eyes. It takes rather an extraordinary man to make what his associates, superiors, and the general public would call an eminently successful supervisor.

The district office is composed of several departments, each headed by a specialist or expert, assisted by one or more under-specialists or technicians. They make up a sort of a large family, and the fact that they may get together easily to thresh out problems, makes for general efficiency in the district office. Living in a larger community, the very contact with an energetic citizenry gives the individuals more pep and has a tendency to make live wires even out of "hay wire" material.

The supervisor, on the other hand, is usually in a smaller town, or, at any rate, has but a small proportion of the man-to-man expert help and advice. The combination has narrowed down so that it is only by continual use of all his faculties and a firm determination to keep things moving that he may keep out of the rut that is laid for so many government employees. The more frequently he can get to the district office under certain limitations, the better chance he has to make his administration sane and effective.

I might go still farther and say that the Rangers who form the first line of defence in forest administration, are still more removed from that advantageous combination of idea and plan which is possible with his superior officers. Too often the ranger has only himself to commune or advise with. His main advantage is that being adjacent to the real work, he has the best chance of knowing actual forest conditions.

The district office being composed of several men with different, but more or less correlated ideas, makes a sort of clearing house. Due to the fact that the Forest Service is young and desires to give its officers a chance for initiative and freedom of thought, it has frequently happened that ideas have been hatched which should have been killed in the egg. They have been allowed to spread out on reams of pure white paper. Requests for reports have been made which are perfectly clear to the originator, but perhaps are ambiguous to the field. This makes every one concerned feel adverse to something or other. A five-minute dictation or perhaps the stroke of a pen from any one of several officers may mean a day or maybe a month of heart-breaking toil for one or more field officers. The importance of guarding incipient ideas and getting out requests in a straight-forward, understandable manner is being more fully realized from year to year: and the result is much less waste. It is certainly a great pleasure to kiss some of the older theories and policies good-bye.

The district office has an immense capacity for information. It is not quite fair to say that they have to whip this information out of the field, but when it is done the supervisor acts as the whip. It is a good whip that will not fray out before the hand that uses it. This is rather a sordid metaphor and I would prefer to hang up one that is perhaps more oily and smoother.

The supervisor is a sort of a double funnel, the shape of an hour-glass, if you please. Through this funnel a mass of widely-separated reports, complaints, requests, and what-not are poured in for him to communicate to the field, and diversely, he must diffuse the widely-scattered information and reports from the field back to the district office. If you can imagine this instrument working both ways at the same time, you have a picture of the supervisor in action. He must be a good operator to keep out congestion. If too much goes in, and too little goes out, or vice versa, he is not applauded. He is not applauded much anyway.

The normal man is more interested in some things than others, but woe to the supervisor who does not take an interest in all the lines of activity that may be wished on his forest. Above all others he may not slacken on fire troubles. If his forest is getting it hot and heavy the supervisor is the man whom every one is depending upon for advice and assistance. Decisions must almost be on tap before questions are asked. Then if ever the supervisor shows his real mettle.

I have written rather disjointedly of a few of the things a Forest Supervisor runs up against. Carrying it too far may lead to erroneous impressions of the Forest Service. When things are running smoothly there is no prettier work than that of the forester: and the supervisor perhaps has the choice location. When his rangers, clerks and deputies are efficient and on the job at all times, the supervisor may have time to look around and do some constructive planning. He may then have time to tune himself to the chords of the district office. When this is done he may expect to hear very little complaint from his superior officers, for what they principally want is to be assured that the various forests are being adequately taken care of and the work is being done economically and in good taste.

Then ye supervisor may take the old car or a saddle horse and ramble over his dominion for days or weeks at a time, tying himself to civilization by no strings other than the telephone line and be secure in the knowledge that he is earning his money more faithfully than when he is grubbing out reports in his office.

ODE TO A PINE

O, PINE, so strong and straight and tall,
With wondrous strength, inspiring all
Who look upon thee, cresting the hill,
Watching alone through the long nights, chill.
Buffeted by storms which round thee rush,
But still thy courage do not crush,
Scarred, yet steady and firm,—O, Pine,
Would I might mould my life by thine!

APPLIED SCIENCE IN THE WOOD-WORKING PLANT

By DONALD R. BREWSTER, Forestry, '10

Specialist in the Seasoning of Wood

Picture to yourself the typical superintendent of a wood-working plant. You see a large, genial man of middle age who welcomes you with a hearty shake of his big capable hand. He is the embodiment of all that is practical. You can read in his face that he has been accustomed, all his life, to the doing of useful things in a useful way with a minimum of wasted time and effort. He has no patience with anything that is not eminently and obviously practical and productive of tangible results.

The spirit and purpose of this man has always animated the wood-working industry. Perhaps the oldest of all industries, with the possible exception of agriculture, the art of working and fabricating wood into useful articles has developed slowly through the centuries by gradual improvements in tools and methods devised by occasional craftsmen of originality. It is characteristic that these improvements have come from practical men—men who have devoted the best years of their life to work at the bench where they learned the nature of wood—its properties, uses, and limitations.

Many of the raw materials of today such as oil, wood pulp, coal tar, starch, and aluminum, were unknown or unused until recent decades when modern machinery and chemical processes have made possible their utilization. But wood has been known and used ever since the day of Adam. Every small boy has whittled wood with his first jack-knife and wood has always been so universal and familiar in our daily life that it has produced the proverbial contempt because of its very common-placeness. Wood, to the average person, is simply wood—a thing in which to take comfort but rarely the interest or appreciation which should be its due.

This very life-long and daily familiarity with wood in its various forms perhaps accounts for the fact that among all the modern industries wood working has been one of the last to take full advantage of scientific research in reducing costs and improving methods and results. The traditional excellence of the hand-made wooden article and the fact that a good craftsman has been able by the use of practical "rule-of-thumb" tools and methods to do work of the highest quality has obscured the need for the application of modern science in wood working and the tendency has been to go on using the old tried methods of the handicraftsman. The introduction of steam and power machinery soon led, of course to wood working machinery and it is along this line that the greatest modern advance has been made. But aside from machinery for sawing, planing, and shaping the wood, which has reached a very advanced stage of development, most of the other processes in the fabrication of wood have, until recent years, quite generally failed to take advantage

of chemical and physical science in their improvement. It will therefore be of interest to note some of the ways in which the up-to-date but still practical wood working plant has learned to make science its ally in the improvement of methods and results.

Modern wood working machines which deserve special mention are those which reduce time and save labor. For instance, there is the machine which produces a dove-tailed glued joint in one handling. There are the planers which plane both sides of a board at the same time and the automatic jointers which prepare the wood for perfect square edge glued joints as rapidly as the pieces can be fed into the machine. There are the foot operated cut-off saws which cut up several thousands of feet of lumber per day. There are the automatic lathes and shaping machines which produce perfect work in a small fraction of the time formerly required by hand. And perhaps most interesting of all are the carving machines which produce an almost exact reproduction of elaborate hand carving on several pieces of wood at once.

In the production of veneer, mention should be made of the many devices which assist in converting a maximum proportion of the log into merchantable veneer. Thermostatically controlled steaming vats prepare the logs and flitches for the lathes and slicers by keeping the temperature at just the right point throughout the process. The huge lathes and slicing machines produce enormous quantities of stock in a day. The automatic clippers trim it to size. The drying machines then dry it in a few minutes flat and ready for shipment or immediate use. Taping machines join the sheets of veneer in a perfect and practically invisible joint for large surfaces.

Many advances have also been made in gluing practice in recent years. Animal glues are kept warm at exactly the right temperature by thermostatically controlled water baths. Excellent and inexpensive glues have been developed from vegetable starches which have proved particularly valuable for veneered work. Water resistant casein and blood glues. have undergone great improvement through extensive chemical research work and have greatly extended the field of usefulness for glued and veneered work by making such work suitable for use out of doors under exposed conditions. Methods have been devised for bending and moulding veneered panels, thus adapting them to many of the same uses as sheet metal. Endless glue clamp wheels have been developed which greatly facilitate the gluing of square edge joints for cores, tops, and other built up work.

Modern painting and finishing practice also shows great improvement. Perhaps the most striking innovation is the application of paint and varnish with compressed air spray nozzles which do the work in an excellent manner in a small fraction of the time required for hand application. Dipping of wooden articles in varnish maintained at just the right consistency has proved to give a superior finish for certain kinds of work. Drying methods and specially controlled drying chambers have been devised for the rapid drying of painted and varnished work.

Not many years ago, the sapwood of the black walnut tree was con-

sidered very inferior because of its light color as compared with the heartwood. Now methods have been developed for steaming all walnut lumber in kilns or vats in such a manner as to permanently darken the sapwood as far in as the center of the board, making it commercially as suitable and valuable as the heartwood for finishing purposes. Steaming under pressure has been found to give a beautiful dark color to oak lumber throughout the wood through a chemical change in the tannic acid contained. This process is known as "vulcanizing" and produces a result far superior to the former methods of chemical "fuming."

Many more ways, might be cited, in which engineering and chemical science has assisted materially in the improvement of wood working practice. Probably none of them are more important than the advances which have been made in the last five years in methods of kiln drying the lumber and conditioning it so as to reduce waste and give greatest satisfaction in use. Most experienced wood workers will tell you today that kiln drying is their key operation. Their kilns can "make or break" them sooner than any other branch of their operations. This is much truer today than it was a few years ago. Lumber costs a great deal more than it used to and the better grades are harder to obtain. It is also more uncertain and difficult to obtain the lumber thoroughly air-seasoned and the partially green condition in which much of it must be kiln dried considerably increases the danger of injury as well as the time and attention required for the drying operation. The large investment required for high-priced lumber has forced most concerns to greatly reduce the amount of reserve stock carried on hand, making them more dependent than formerly upon the steady and satisfactory operation of their kilns to provide raw material and prevent enforced shut-downs. The old days, when lumber could be dried in a hit-or-miss manner without serious loss, are past and gone.

Largely through the research work conducted at the Forest Products' Laboratory at Madison during the past eleven years, a large and complete fund of information has been developed in regard to correct kiln drying methods and equipment. Fortunately this information was available when the United States entered the war and played an indispensable part in making it possible to quickly season huge quantities of airplane spruce and black walnut for propellers and gun stocks without injury to strength and with practically no loss. Since the war, all industries, including the wood working industry, have realized as never before how valuable science can be in solving their practical problems. Such wonderful things have been accomplished in this way that almost anything seems possible. In these days the most practical men are the most ready to give science credit for its accomplishments and the most desirous of taking advantage of every improvement in methods or equipment which gives promise of saving time and money and reducing waste of labor and materials.

Perhaps the most important development in kiln drying has been the working out of schedules giving the correct temperatures and humidities to use in obtaining a maximum rate of drying consistent with safety of the material. Hardly less important has been the discovery of methods

of treating the lumber with steam during the drying process in order to prevent or relieve casehardening and thus avoid injury from honey-combing and loss from twisting and warping due to internal stresses during the various stages of manufacture and storage. In the line of equipment, the discovery and development of the water spray humidity-regulated type of dry kiln deserves particular mention. For the very exacting requirements in the drying of heavy oak vehicle stock remarkable results have been secured with this kiln and it was this kiln which played a major part in the successful drying of airplane material and gunstocks during the war. No other kiln in use today is capable of such close regulation and uniform drying as this kiln developed through scientific research at the Forest Products' Laboratory.

So much for the accomplishments of science up to date. No one can predict what the future will bring to light for the benefit of the wood working plant, but it is not unreasonable to expect a continuation of the same rapid development of new and improved methods, processes and equipment that has resulted from the active thought and efforts of many fertile brains during the past few years. Certainly no one will contend that there are not still many obvious difficulties to be overcome and improvements to be made before wood working will have reached its highest stage of development.

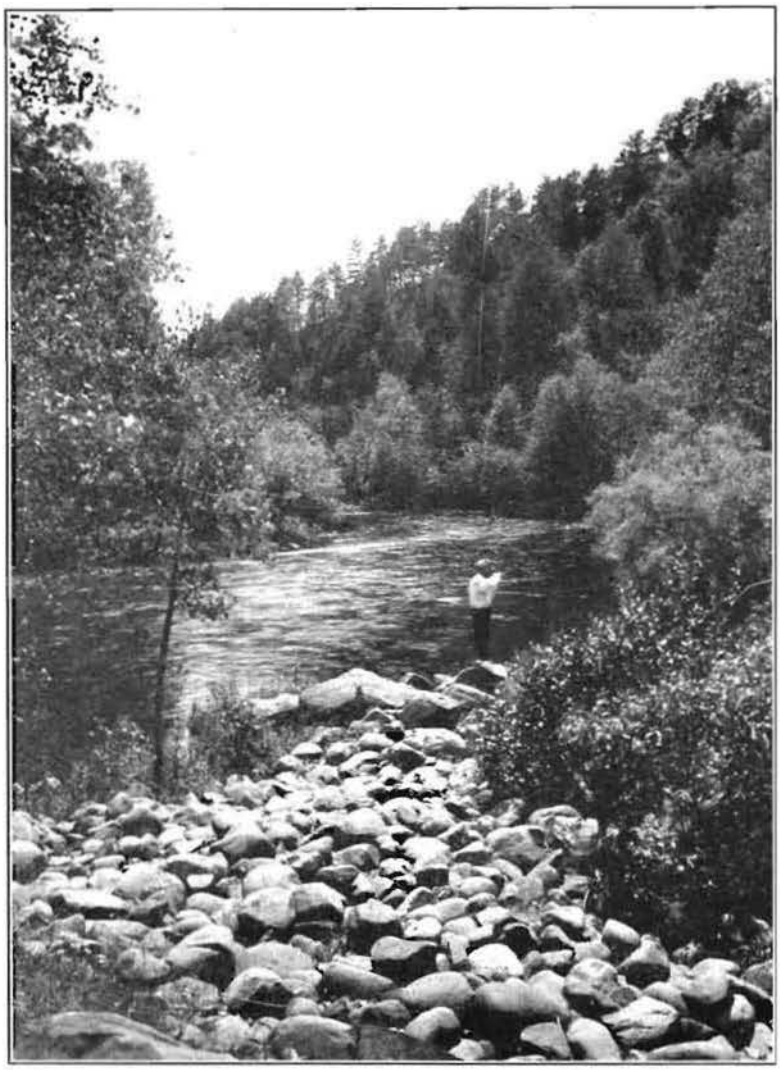
In spite of what has already been done, no branch of wood working practice offers opportunity for greater improvements than does seasoning. Our best methods today require three months or more in a dry kiln for heavy oak stock and from 5 to 10 days for such simply dried stock as one-inch air-dried chestnut. Compare this with the few minutes required to dry veneer or cloth or paper or food products. Lumber dries by the same basic process of evaporation used in drying these other materials. Surely there must be some application of the laws of chemistry and physics which will make it possible to dry the moisture from lumber on a commercial scale without injury in a very much shorter time than is required by present methods. The discrepancy between the time required for drying lumber and for other materials is so inconsistently wide as to make it seem practically certain that far-reaching improvements can and will be made in this respect.

One method which suggests itself as a distinct possibility for reducing the time required to dry lumber is drying in a partial vacuum. Laboratory tests on a single board in a vacuum cylinder have shown that when the board receives heat by direct radiation from the heated walls of the cylinder the moisture vaporizes much more readily than in atmospheric pressure and at a lower temperature just as water boils more readily and at a lower temperature on Pike's Peak than at sea level resulting in a drying period of a comparatively few hours. Drying lumber in a vacuum cylinder is impracticable, however, because if a pile of lumber were put in such a cylinder there would be no way to transmit the heat to the boards in the interior of the pile. The expense of the process would also be prohibitive.

Still, it would seem entirely possible that science and ingenuity will

eventually devise some commercially practicable method of utilizing the vacuum principle for the drying of lumber. The tremendous power of a cyclone or tornado which lifts up whole buildings and drives wooden slivers through steel plates is the result of the creation of a vacuum. Is there not some way of creating an artificial cyclone around a pile of lumber which will draw the moisture out by the power of a vacuum? Certainly the tremendous savings which would result if lumber could be dried cheaply and safely by standardized methods in a few hours instead of many days and careful watching as at present will justify an untiring search for a successful method of accomplishing this result.

The wood working industry is today facing a period of declining prices and slackening demand which bids fair to continue for some time to come. In order to successfully meet the problems of this period and to continue in profitable operation, every plant will be forced to introduce economies and improved equipment and methods at every possible point. Those plants which can produce desirable products at the least cost will stand the best chance of surviving the trials of business depression. Experience of recent years proves beyond question that applied science is industry's greatest ally in solving the problems of efficiency and economical production. The prosperity of the wood working industry demands that every encouragement be given to the prosecution of scientific practical research work and that every opportunity be taken by the individual plant to promptly apply the results of that research to the correct solution of its own problems.



APPLE RIVER

THE CARELESS SMOKER

(Apologies to Kipling.)

A fool there was and his pipe he lit
(Even as you and I)
On a forest trail where the leaves were fit
To become ablaze from the smallest bit
Of spark—and the fool he furnished it.
The day was windy and dry.

The forest was burned to its very roots,
Even beneath the grounds,
With the flowers, the birds and the poor dumb brutes.
Old hoary oaks, and the tender shoots
Which might have made logs but for such galoots
Allowed to wander round.

The lumber jack has now passed on,
His payday comes no more;
And the screech-owls haunt the camp at dawn
Where the cook's tin pan woke the men of brawn.
But the mill is silent, the trees are gone,
The soil and the forest floor.

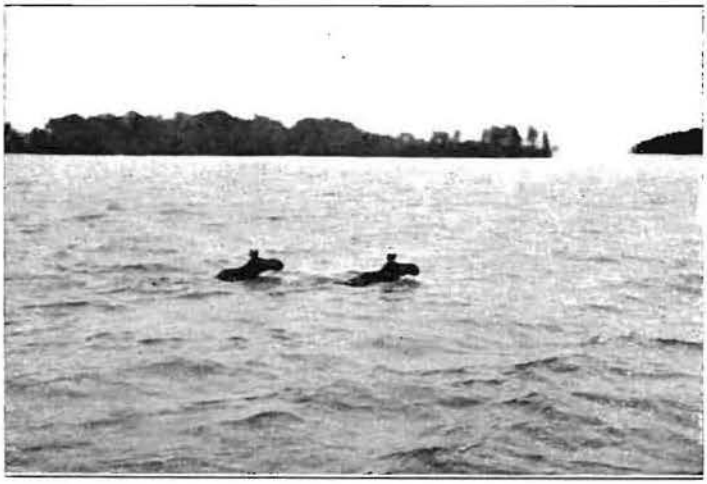
A deadly sight are those hills of rocks
Which once were beds of green.
No hope for the human, no food for the flocks,
The floods must be held by expensive locks
And the harbor is silted to the docks.
The ships no more are seen.

But the fool smokes on in the forest still,
Leaves the campfires burning, too.
While the patient public pays the bill
And the nation's wealth is destroyed for nil.
If the law doesn't get him, Old Satan will
When his smoking days are through.

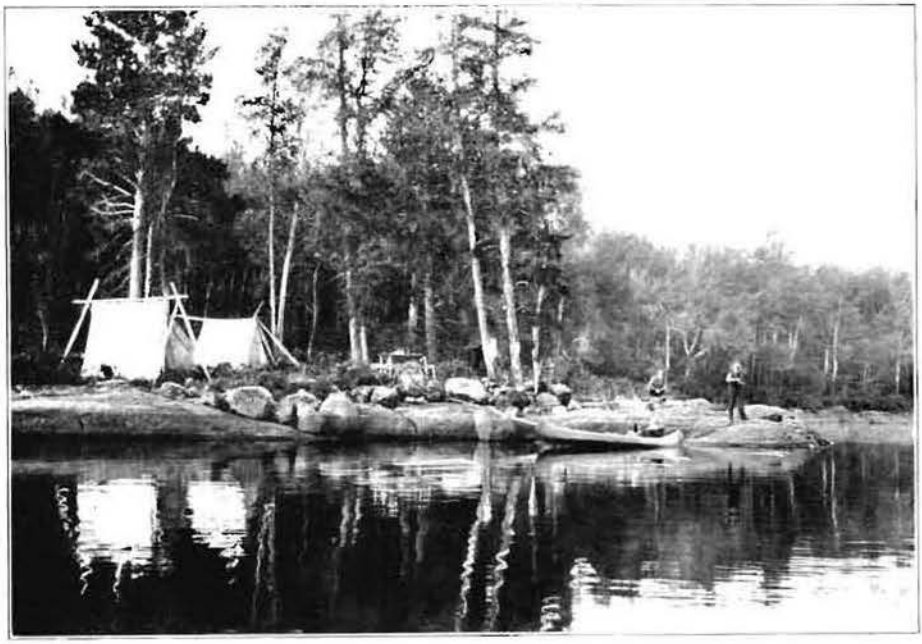
—By Harris A. Reynolds in "The Open Road."

ONLY

Only a man in a forest green—
Only a match that was dropped unseen.
Only a flame, some leaves and wood—
Only a waste where the forest stood.



LAKE VERMILLION



LAC LA CROIX

TRAINING OF AMERICAN FORESTERS FOR TROPICALWORK

By H. N. WHITFORD

Yale University. Assistant Professor of Tropical Forestry

In order to show what course of training in forestry is necessary for success in the tropics, an enumeration of the classes of work now open to foresters is advisable.

1. At the present time there is a considerable demand for men to make examination of forest properties in the tropics with a view to obtaining data for their successful exploitation. Heretofore owners of such properties have mostly depended on men without training in forestry to do such work. They have sought men who have had experience in the tropics regardless of their training but the time has arrived when such owners are seeking those trained in forestry methods, and naturally those that have also had experience in the tropics are preferred. Such experience cannot be gained in schools, but attention can here be called to certain classes of work now given in our schools that will greatly aid one in this direction. Because of the more complex composition of tropical forests a good training in the principles of systematic botany is quite essential. The better this training, the more one will be able to cope with the new problems. One does not need to be a systematic botanist, but he should be able to distinguish closely related species from each other by their gross characters. With a knowledge of collecting and carefully drying botanical specimens, he can depend on professional systematic botanists for the final determinations. In most forest schools good courses in local field dendrology are given. If these courses are conducted properly they give one training in close observation of the non-systematic botanical characters of the trees that is essential to one when he "drops" into a tropical forest. In a short time, with close application and collection of botanical and wood specimens, he can obtain a general working knowledge of the forest, the first essential to a successful examination. With such knowledge it will be apparent to the reader who has had a forestry training, that if he is well grounded in methods of estimating stands and the general engineering problems connected with the utilization of the products of the forest, he is equipped with the essentials that will enable him to make a successful report.

2. Some owners of tropical forest properties besides wishing to know about their forests, also want knowledge concerning the agricultural value of the land after the timber has been removed. A good general forestry education fits a man to answer all the questions in a general way, including agricultural and engineering problems, better than any other one type of trained men. The trained agriculturist would likely know little about the forests or the engineering problems and the engineer would be at loss concerning the strictly forestry and agricultural sides of the work. In a word the forester is best trained to do this class of pioneer

work, the object of which is to collect information for the owner which will show him whether or not the working of the property can be successfully accomplished.

3. Another opening for American foresters is the search for raw materials essential to certain industries. Some industries are getting exceedingly anxious concerning their future sources for raw materials of various kinds. There are a number of instances where trained foresters have been employed in this class of work. Some time ago a forester investigated the coastal region of northern South America in search of tanning materials for a prominent leather company. Another forester has recently returned from an exploring expedition in the Quebracho forests of the Gran Chaco region of Paraguay and northern Argentina for the leather company in which he is employed. Still another forester is in the Malay region investigating the gutta-purcha situation for an electric company. A trained forester is employed by a firm dealing mainly in imported tropical forest woods of various kinds. This man has made a number of trips to the tropics in matters connected with the business. It is apparent that such men must either have a knowledge of the species that produce the products required, or by their training must be equipped to pick up this information by careful investigation.

4. Another outlet for American foresters in the tropics has been created in the rapid advance made in recent years in rubber planting. Ten years ago rubber was largely a wild forest product. Today fully 90 per cent of the rubber of commerce comes from planted crops. Many of the problems connected with this cultural forest crop are those which the trained forester is best able to handle, and the rubber companies recognize this fact, for at least three American foresters are now employed by Dutch-American concerns in the Island of Sumatra. As other wild tropical forest products of especial kinds near the stage of exhaustion capital will become interested in raising them as forest crops, or will need men to discover new substitutes. The logical men to handle such work are foresters. It is apparent that a well grounded training in silviculture problems is essential for this class of forestry work.

5. The main outlet for American foresters has been positions connected with the governments of tropical countries. From our standpoint these can be divided into three —colonial governments of the United States, colonial governments of European countries and independent tropical governments of which the twenty Latin-American republics are included.

Practically all of the tropical colonial governments have forestry departments. Naturally colonial European countries look to the home governments for their foresters. Recently, however, a number of American foresters have obtained employment in British colonies. One is research officer for the Forestry Department of the Federated Malay States. And very recently a number, three I believe, have been employed by the British Indian government for work connected with the exploitation and use of the forest products.

In the twenty Latin American republics forestry has not as yet made much progress. But some of these republics are awakening to the neces-

sity of better conservation methods and will perhaps call upon American trained foresters to act in advisory capacity or for special investigative problems.

The tropical possessions of the United States, especially the Philippines, have been the chief outlet for American foresters. During the twenty years the Philippines have been a colony of the United States, some thirty American foresters have been employed by the local government. About half of these are now engaged in tropical forestry either in the Philippines or in private or public forestry work of neighboring governments. In the past the Philippines have been the main place for foresters to obtain their tropical experience. In spite of the fact that they are training Filipinos as foresters, there is still a demand for American foresters which is likely to continue for some time to come.

All of the foresters who have practiced their profession in the Philippines had no training other than good general courses in forestry. In fact the principles of forestry for the tropics are the same as for temperate regions. The application of the principles are different, however, and the climatic, social and economic conditions under which the work is done are dissimilar to ours. The man who undertakes the work must be morally and physically sound and be able to adapt himself to the new environment, without loss to his moral and physical stamina. This depends on the man and not so much on his training.

The courses in forestry given at the Yale School of Forestry are designed to supplement the general courses in forestry. A general course in tropical forestry has for its object a general survey of the tropics as regards the forests, their distribution and character, the commercial products they contain and the role they are likely to play in the future. Emphasis is laid on the economic conditions with regard to their exploitation and the degree to which forestry can be practised in them. Special courses are offered to meet the needs of the student taking them. Courses in identification of tropical woods are given and are necessary for certain classes of work in the tropics. As already mentioned some knowledge of the systematic relationships of the tropical families is important and such courses are offered. If the student should wish to prepare for work in a particular country, stress is laid on getting as much knowledge as possible of this region. In a word, in so far as possible, the courses in tropical forestry are designed to meet the particular requirements, and to equip the student for tropical work.

TROPICAL FORESTRY

Min.: "Where's Flossy gone?"

Andy: "He went to look for his ax. He tried to chop down a rubber tree."

Prof. Allison

GUMPS

ALL SET

1920 ~ FROSH ~ 1921

DEVELOPMENT OF THE CEDAR POST AND POLE INDUSTRY

S. S. HARRIS

Because of their durability on contact with the soil and because of their combination of lightness in weight with strength, northern white cedar (thuya occidentalis) and western red cedar or western white cedar (thuya plicata) have during the past thirty to forty years become very popular for use as posts and poles.

At first, their use was confined to those territories to which they could be shipped on a comparatively low rate of freight and where other species which had previously been used for these purposes were not competing.

Today with the gradual extinction of other species, such as chestnut and southern white cedar, in the pole using industry, cedar poles have found a wider market, with the result that today western red cedar in the longer lengths, produced in Idaho, Washington and British Columbia is being shipped as far east as New Hampshire, Massachusetts and Connecticut, and as far south as the Carolinas and Georgia, and on rates of freight which ten years ago would have been considered prohibitive.

The factors which promoted the use of western red cedar poles in these far distant territories were, first, the inability to get a sufficient supply of chestnut, and second, because the lightness in weight of cedar made pole line construction much cheaper.

Both northern white and western red cedar are recognized as being very durable in contact with the soil. They compare favorably with chestnut and are excelled only by locust, osage, orange, eucalyptus and redwood.

The market for cedar fence posts lies entirely with the retail lumber trade, because posts are purchased usually in small quantities by farmers from their nearest lumber dealer. For this reason, most of the northern white cedar and western red cedar fence posts are wholesaled in carload lots to the retail lumber dealer.

Northern white cedar posts are regularly manufactured for ordinary fencing in lengths 7 feet long. Six and one-half feet is the standard length for western red cedar axe split posts, although road posts in both the 6½- and 7-foot lengths are manufactured.

Northern white cedar posts because of freight rates and of the distribution of other species, find their largest market in the lake states, and particularly in the prairie states, where native timber is not available for this use. The bulk of the northern white cedar posts find their market in the states of Illinois, Iowa, Nebraska, Kansas, the two Dakotas and southern Minnesota. In western Minnesota and the two Dakotas, western red cedar axe split posts are gradually creeping in on the northern white cedar post trade. Heretofore the largest market for them has been found in Montana, Wyoming and eastern Colorado.

It is generally recognized that northern white cedar posts are much more substantial and durable than western red cedar axe split posts. The price factor, therefore, has been the one which has enabled the western posts to make any inroads on the northern white cedar territory.

The market for cedar posts, both northern white and western red cedar, is confined to the electric light, electric railway, telephone and telegraph industries. In order to keep actively in touch with the market and to enable them to distribute and find sale for all of their production, most cedar pole producers have had to build up their own selling organizations and in most cases, separate this particular department of their business from the sale of posts, the outlet of which is confined to the retail lumber dealer.

With keen competition it was found necessary to keep in close touch with practically all of the buyers, not only through mail but by personal calls. In order to do this effectively, most of the large producers have branch sales offices from which men regularly travel keeping in close contact with all of their prospects.

Fifteen to twenty years ago northern white cedar was available in practically all sizes commonly used by electric light and telephone companies and in practically any quantity, with the result that it found favor because of its relative weight and because of its heavy, stocky butts with the tremendous area of wood at the ground line. The result was that as long as these northern poles were available, the more progressive buyers preferred them. The older telegraph and telephone lines, as well as electric light and electric railway construction in the larger cities therefore were built from the old northern white cedar poles produced in northern Michigan, Minnesota and Wisconsin.

The supply of northern white cedar, especially in the longer lengths, gradually became smaller, making it necessary to get these longer poles from other sources. Today northern white cedar, because of its price and availability, is used largely by the telephone industries in lengths 30 feet and shorter, while the electric light industry who must necessarily raise their lines further from the ground, use western red cedar, which because of its availability and lower price in the longer lengths is better adapted for this purpose.

The supply of northern white cedar is rapidly becoming exhausted. In fact, it is estimated that another decade will see the last of the present stand of timber which will produce poles of desirable sizes. This means that in another eight or ten years practically all of the poles used by both telephone, telegraph and electric light industries will come from the west.

It should not be overlooked that electrical supply jobbing houses have been a factor in the distribution of cedar poles. In most cases, they handle, on a commission basis, the poles of one producer, and as they cover their respective territories very thoroughly, they are closely in touch with the smaller consumers. Perhaps 40 or 50 per cent of the poles sold are actually ordered through these electrical supply houses.

The specifications for poles have been standardized to a large extent.

The standard specifications are the result of mutual agreement between the producers and consumers of cedar poles, and determining just what each would be able to do within reasonable limits. The consumers found that certain defects were permissible and did not detract from the utility of the pole. This in turn enabled producers to make a more liberal selection of timber, which otherwise would make the expense of production entirely prohibitive.

Inasmuch as poles are all produced under these standard specifications, the sale of cedar poles and the competition found in marketing them necessarily resolves itself into, first, salesmanship, second, ability to give service as to shipment, and facilities for offering Butt-Treatment of poles, which is entirely without the scope of this article. Most of the producers of cedar poles have found it necessary to establish concentrating yards at some central railway point from which quick shipment could be made.

In the new construction of electric light or telephone lines, poles are usually the first consideration and it is necessary to have them on the ground first. For this reason, producers and distributors of cedar poles must be prepared to give shipping service which is probably uncalled for in other lines of construction material.

The future of the industry is assured. With the entire depletion of the supply of chestnut poles in the East, it will mean that that territory as well as the South must look to the West for their future pole requirements.

Southern creosoted pine is a competitor, but will not remain so for any great length of time or to any great extent, first, because of its weight: second, because of its conductivity, which makes them dangerous for use on high tension lines; and third, because it is very difficult indeed to get linemen to stay on the job where the poles are covered with creosote.

Undoubtedly the biggest outlet and greatest sale for cedar poles within the next few years will be found throughout the central and eastern states for use in building farm transmission lines. Farmers are realizing that for many years they have needlessly gone without the conveniences which were within their reach, with the result that they are rapidly organizing and building co-operative lines. This means that the farmer has electric as well as telephone service right at his door and electric light and power for many uses on his farm.

While cedar is comparatively long lived, yet it is necessary to make replacements; particularly where the poles were set without the application of any good preservative. On a great many lines throughout the central section of the country, this replacement time has arrived. The supply of western red cedar poles is sufficient for several decades to come, and with the promised demand, there is no question but the production and distribution of cedar poles is a permanent industry.

FORESTRY CLUB

THE Forestry Club of the University of Minnesota is perhaps the most active organization of its kind in the United States. There can be no doubt that its activities extend over as broad a field, and its influence is just as great, as similar clubs at other universities. Aside from that, it is the only Forestry Club in the United States that boasts a house of its own. The advantages offered by owning such a house are self evident. As a nucleus and a framework upon which to build a solid and active organization it has proven very efficient. The men who live at the house and those from outside all regard it as their own and they use it for all possible things including dances, dinners, meetings and the like. It is the source and center from which animate all the waves of Minnesota Foresters activities.

FORESTRY CLUB

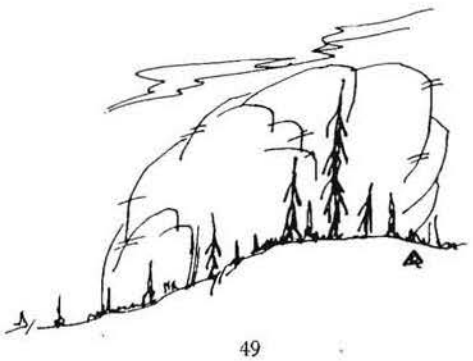
As a real and active assistant to new students the club is unequalled. When the embryo Forester comes to school for the first time he is bound to find himself beset with all the worries and inconveniences that are the lot of every freshman. Thanks to a kind providence, however, the new Forester is favored. During the trying ordeal of registering he is bound to be discovered by some member of the Forestry Club and there his

troubles are ended. The upper-classman feels it his duty to take the freshman in hand and acquaint him with his new work and his fellow Foresters. A short time later, perhaps, the newcomer will be given an opportunity to become a club member. The fact that all students in the college, with one or two exceptions, are members of the club proves that it is truly representative and that every one realizes its worth to himself.

The club this year has been especially active. Since school started last fall there has been something doing at all times, and every minute, literally speaking, has been occupied with Forestry activities. There have been meetings of the club, all well attended, at which men prominent in Forestry and in other scientific lines have spoken. There have been social affairs that for good recreational diversion were well worth the effort expended to make them successful. At the time this article was written the club was in the midst of preparation for its Annual Minstrel Show which was to be given on February 25th. For March 3rd at the Agricultural gymnasium plans were under way for the Annual Foresters' Ball. In spite of all this outside work the members of the club have not fallen into the habit of letting their school work be of secondary importance. According to reports from the registrar's office there was not a man expelled from school because of delinquencies in studies during the fall quarter. This was an enviable record in face of the fact that a great number were ousted from the other colleges.

The future of the Forestry Club can be as great and as far reaching as the Forestry profession itself. The man who takes Forestry at Minnesota from henceforth will find an efficient and strong organization with which to work and through which he can accomplish many things. Upon his shoulders rests the future of the club and similarly the club will be to a great degree responsible for his success. Let us fall back on the old axiom: United we stand; divided we fall.

OTTO W. ANDERSON



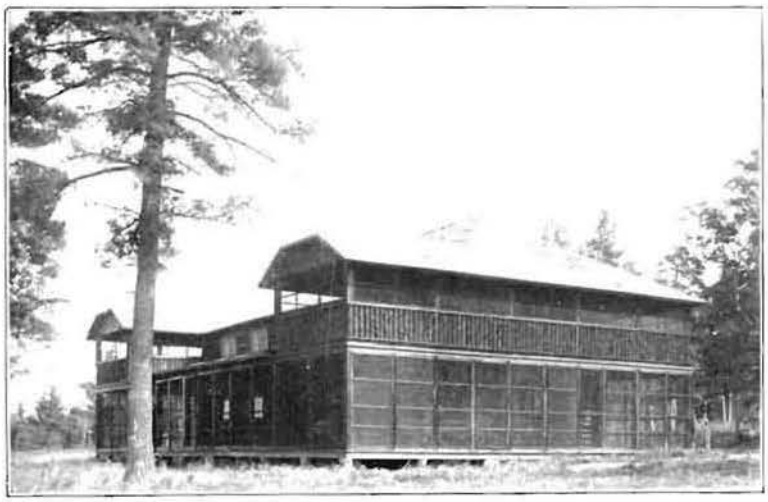
XI SIGMA PI

Xi Sigma Pi honorary fraternity in Forestry, was founded at the University of Washington in 1908. It has six chapters in various Forest schools in the United States. The Delta chapter was established at Minnesota in 1920 and at the present time is composed of twelve students and eight members of the faculty.

New men are chosen from the upper two-fifths of the juniors and seniors in the College of Forestry. In selecting a man not only is his scholastic record considered but also his practical ability, capacity for leadership and promise of attainment.

The object of this fraternity, to quote a part of the constitution, "is to secure and maintain a high standard of scholarship in forest education, to work for the upbuilding of the profession of Forestry, and to promote fraternal relations among earnest workers engaged in forest activities."

Xi Sigma Pi is the only fraternity composed solely of foresters. Such an organization should be, and is, an important factor in college life. For the underclassman it is an incentive towards work and towards the participation in campus activities with the real Forester's spirit; knowing that worth, both within and out of the classroom is the criterion by which he is judged. To the upperclassman, it means an association with men who are seriously interested in the profession and who are striving towards its upbuilding.



BUNK HOUSE—ITASCA PARK

1921 JUNIOR CORPORATION'S LOG

By Burton W. Thayer, '22

OFF for Itasca. Eight members of the Junior Corporation left Minneapolis on March 31, 1921. Tearful farewells were lacking. At Park Rapids we transferred our belongings to the Great Northern Hotel, where we roomed during our stay, but brought down the wrath of the proprietor because we habitually ate at the Park Hotel, his competitor. Thayer and Youngers exchanged some twelve gauge shells for some sixteens, having made a slight error in estimating the size of their shotgun, while in Minneapolis. That afternoon the hardy crew blossomed forth in woods clothes, having decided to revive the old tradition of walking to the park. As it turned out, we not only walked to Itasca, but also pushed a —?—ton truck loaded with our luggage, through the worst mud roads known there for years.

Arriving at the thriving town of Arago that evening, we were told by one of the prominent citizens that from there on, the road was in excellent condition. One more mile of this excellent road was all that our truck could navigate, so after a careful survey, we discovered a camping place almost above water level where we prepared a hasty meal

of bread and two boiled eggs per each, on this first day of April, our April Fool's Day. Enough to say that through the combined efforts of the hardy crew and a few natives we arrived at the bunkhouse two days before our course was to begin, just time enough to saw wood for ourselves and the freshmen.

The first half of our quarter's work was "Forest Regulation," under Professor Allison. Much of the work of surveying and mapping necessitated wading through swamps of ice cold water, Tilden taking first prize in adaptability, as he very quickly developed web feet.

A typical day began with the sweet dulcet ringing of Chesebrough's spasmodic alarm clock, signalling to the good humored K. P., that it was time to extricate himself from the bedclothes, take off a couple shirts, and then flee up to the pump in search of water for the cook. This particular pump was a trick one, which needed priming several times and functioned easier if especially arranged biblical quotations were recited to it, in soft modulated tones.

After being called by the K. P., the hardy crew plunged into the lake for a morning swim, care being taken to evade the floating ice cakes, and then after breakfast, walked to the Squaw Lake District where we mapped the forest types growing on the celebrated hills of that region. Fortunately we always seemed to correctly calculate the time necessary to get back in time for supper, our crew holding a one hundred per cent record for promptness. By way of variety, our supper sometimes consisted of a tender young beaver, donated by the local game warden, the flesh being very palatable, quite similar to the common house rat.

The fore part of the evening was usually spent in a tight game of "horseshoe," Tilden and Youngers vs. Nelson and Burton. The contestants were urged on to greater efforts by loud huzzahs, whistling and stamping of feet from the audience on the woodpile. When darkness descended we repaired to the cheery fireplace where "Leffelman's Argul Orchestra" favored us with the latest syncopated jazz music. Often when we sat toasting our toes and puffing our Missouri meerschaums, we would hear the wild, wailing, howling of the wolves, the most weird, ungodly sound of the woods. The hardy crew would then put on a couple extra shirts and hit the hay, after a few predictions as to the work and adventures of the morrow.

One event which caused considerable comment was Tilden's horrible encounter with a bloodthirsty woolpy, which charged him several times, gnashing its teeth with rage. It was only with the utmost dexterity that Tilden evaded its rushes and climbed to the top of a Juniperous communis. The fury of the combat was indescribable.

Our acquaintance with the wild life of the park was enlarged through another well remembered incident. Early one morning about nine o'clock, Youngers and Thayer were debating on the inadvisability of getting up, when the "Swamp Angel" rushed in, using the vilest language imaginable. It seems that a skunk had gotten under the porch in some way and could not get out. We went down stairs in our pajamas and poked the skunk kindly with poles. The skunk objected violently, so violently in fact

that the boys found it advisable to remove their bedding from the bunkhouse and also their clothes which they expected to wear to a dance that evening. Much postmortem advice was given as to how the woodspussy should have been taken out, most of the fellows seeming to think that it was a bad idea to poke it with poles, Chesebrough being especially emphatic in views.

It might be best to end this tale of crime with a very touching incident which occurred during the latter part of our stay, proving that our experiences had, on the whole, a very elevating influence. It is as follows: Wilson, Nelson, Burton, and Youngers went to Park Rapids to a dance one night. After the struggle the boys slept at the hotel and were awakened from their slumbers by Brother Youngers who "saw the light." Brother Youngers in the past had not been noted for his pious attitude towards life, but apparently realized his sinful ways and sat up in the bed crying: "I see the light!" "I see the light." Ever afterwards he seemed very exalted.

On June tenth, shortly after this very edifying incident, our "winter" stay at Itasca ended, most of the boys going into some sort of forestry work for the summer. The eight members of the hardy crew will never forget the Junior work at Itasca which in retrospect seems to have been a seventh heaven.

THE 1920 FRESHMEN

"Read-em-an-weep! My infant child needeth a new pair of shoes. Shoot, you're faded! Horse collars! You too, Sailor! Here we are. boys, grab your packs and let's go!"

The above vulgarisms were expressed, one early afternoon, on board the Milkshake Special headed for Park Rapids. After arriving at the thriving town, an extended survey of available motor lorries was made, before one could be found to tote our luggage to Itasca.

Never had a more enjoyable or profitable summer been spent by any of the gang. We became acquainted with nature, and its lores. Lodge hounds were plentiful in our midst, along with the true tennis fiends.

One time Prof. Cheyney sent a party to the southern part of the Park on a mapping expedition, with the following directions: Twenty feet from a birch tree the corner stake for that section was to be found. With a few more explicit notations, the hardy crew fared forth. After considerable delay and circumvention Eddie and Steve found the said stake. Here a few choice quotations were expressed on the value of Cheyney's explanations. This all happened because in place of the birch only an alder stood. The crew, after considerable discussion, decided that Cheyney meant what he had said so they called the tree by its new name, Betula Cheyneyifera.

Many incidents could be enumerated of both tragic and comical nature but as Dockstader would say, "Let her ride." So we will close with, "You're covered. Shoot!"

A BEAVER LODGE IN ITASCA LAKE

FRESHMEN OF 1921

By Maxon Pillow

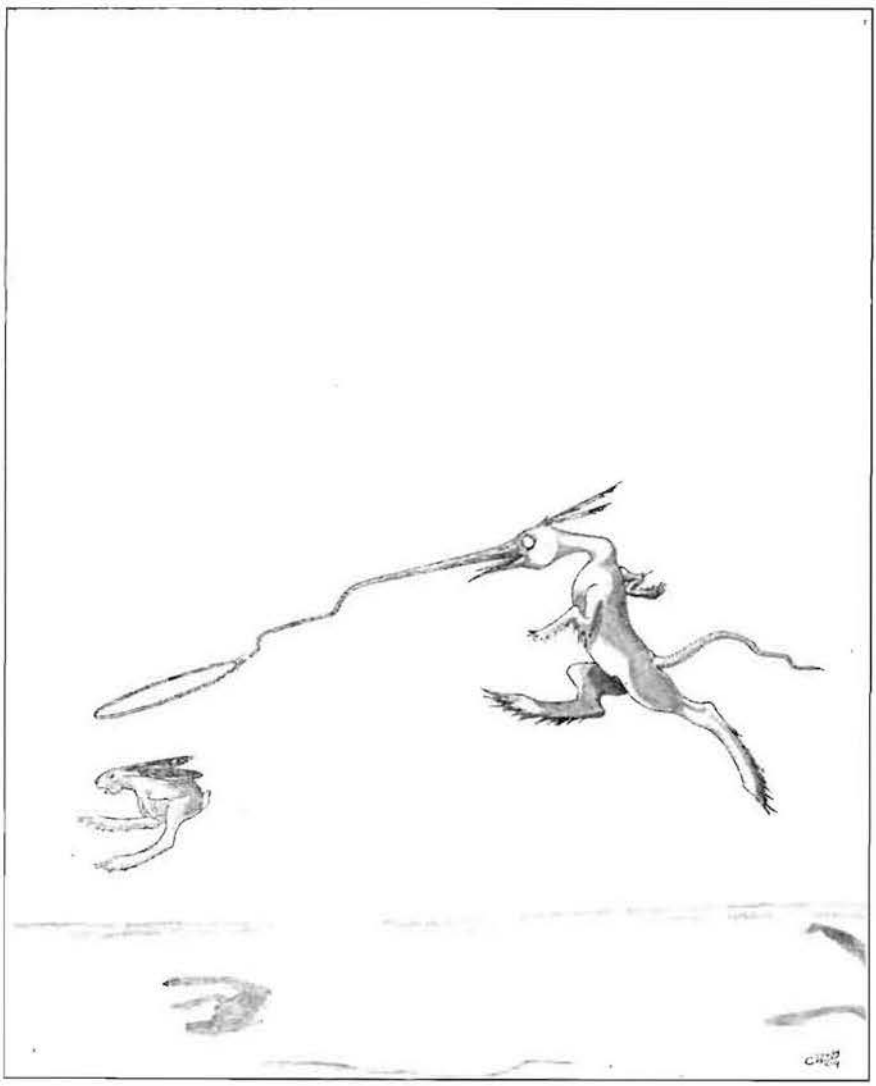
It was a hot June day when the Frosh of 1921 started their journey to Itasca Park for their Freshman work. The gang, 22 members strong, with Shorty Persons as an accessory, pulled into the Park on the evening of June 18, 1921.

Getting settled and used to our surroundings, including Douglas Lodge, took all day Sunday. Monday, June 20, began our first real work as foresters, with the usual routine of pacing and running lines. Of course, J. P. took us on long rapid hikes to unknown lands where mosquitoes and brush, the tangling kind, abounded. Then in rapid succession, Allison taught us to scale and estimate timber, and draw maps of the surrounding country. Wentling had the misfortune to run a nail in his foot, so the sylvicultural work was done on the front porch in drowsy lectures, and from high points of land which are convenient to map types and topographic conditions from. Dr. Charlie Rosendahl gave us a short snappy course in identification of brush and ground cover in the Park.

But the summer wasn't all spent in work. Needless to say the Lodge wasn't neglected. The Corporation gave two successful dances, and secured return engagements from the Lodge. Numerous ladies delighted the hearts of certain foresters during the summer. July 4 was spent in a grand revel at Park Rapids.

But as Kipling says, "It all comes to sitting and thinking." A forester thinks often of the good times and fellowship at the Park, and also of the value of the work and man-making conditions there.

FACULTY ROW



THE ROPERITE

THE ROPERITE

(Rhynchoropus flagelliformis)

By Wm. T. Cox, '06

In the foothills of the Sierras, where the digger pine grows, dwells one of the most peculiarly specialized animals to be found anywhere on the American continent. No one knows its life-history, even approximately, and many a discussion has been based upon the question as to whether the beast is born, hatched from eggs, or comes into existence spontaneously from some mountain cavern. The Digger Indians say that roperites are the spirits of early Spanish ranchers, and blood-curdling are the tales they tell of hapless creatures pursued by the beast and snared with its marvelous rope-like beak, and dragged to death through thorny chaparral. No man or animal can hope to outrun it. It steps upon road-runners or kicks them out of the way, and no obstacle appears sufficient to stop its progress or even slacken its speed, as it seemingly half flies, half bounds across the rugged country which it inhabits. Its leathery skin is impervious to thorn and its flipper-legs uninjured by the sharpest rocks. According to A. B. Patterson, of Hot Springs, California, who saw the last roperite authentically reported, the animal has a large set of rattles on its tail, which it vibrates when in pursuit of game, thus producing a whirring sound like that of a giant rattler. The effect of this upon an animal closely pursued may be imagined. Lumbermen operating in the region between Pitt River and the southern end of the Sierras are urgently requested to make every effort to secure a living specimen of the roperite.

—From Fearsome Creatures of the Lumberwoods.
Illustrated by Coert DuBois.

THE DRAGON

Sometimes the mill runs nights
And then
Is when
I like it best—
I like its thousand lights
That gleam
And beam
Upon the West;
The sun goes down, and there
Instead
A red
Glow fills the skies—
Upon the hill
The dragon mill
Looks down, and winks its eyes.

—DOUGLAS MALLVEH.

THE MAN WHO INVENTED LOGGING

It was Saturday evening and the trail crew was having a very interesting meeting of the "fire-side league." The lone forest student was trying to explain to the rest of the crew (mostly old lumberjacks) the advantages of overhead skidding.

"Say, boy, did you ever hear of the man who invented logging?" asked the oldtimer.

"No, I don't know as I have," answered the stude.

"Well, your education has been sadly neglected," replied the oldtimer. "Let's see now, it was when I was just a kid that I heard of Paul Bunyon. As I remember it, there ain't no exact date given for his birth. he just growed. I didn't get around to work for Paul until he was loggin' on the Great Lakes. It was the winter of the blue snow and his camp was up where the Little Gimlet empties into the Big Auger. We was figurin' on deckin' our logs on Lake Superior. Paul was his own efficiency engineer. He never figured labor costs by standin' round with a stop watch countin' a laborer's motions and deductin' the ones used for borrowin' chews, goin' for drinks, inquirin' the time, dodgin' the boss, lightin' pipes and preparin' for quittin' time. Paul eliminated all the labor he could and I remember his sayin': 'What's the use of all this sawing, swamping, decking, cutting crosshauls, grading roads, loading, hauling and landing, when I have Babe?' "

"Who is Babe?" asked the lad.

"Babe! Don't you know who Babe is? Well, I'm surprised. Babe was Paul's big blue ox. He was seven axe-handles between the eyes and as strong as the breath of a tote-teamster. No lake was big enough for a waterhole until Paul dug the basin where the Great Lakes are now. Every time Babe was shod they had to open up another Minnesota iron mine. He could never be fed twice at the same camp as one meal exhausted all the feed one outfit could tote in a year. In spite of his overhead costs and maintenance, Babe was a very valuable piece of equipment because of his high efficiency and low operating cost. Babe loved a joke and would slip up behind a log drive and drink all the water out of the river, leaving the logs high and dry. Again he would stamp on a ridge forming a lake shore and crushing it down, let out the water to flood some riverbed and drown out some low-water drive. He pastured all over northern Minnesota and the countless little lakes of that region are but the tracks of this mammoth bovine. But enough of Babe for a while, we were talking logging.

"This is the way Paul used to do it. He simply hitched Babe to a section of land and snaked the whole 640 acres to the landing at one drag. There the trees were cut off just like shearing sheep and on the return trip the logged section was hauled back to its original place and another timber one hauled out. Six trips a day six days a week just cleaned up a township, for section 37 was never hauled back on Saturday night but left at the landing to wash away in the spring."

MAKE IT SNAPPY

ALL TOGETHER MEN—SOME??????

PEAVEY—IT STICKS

After a lengthy and long lost struggle we have thrown together the following conglomeration of pathos, wit, humor, poetry, and we beg the joy befogged, ever critical skijumpers, including snuss-chewers, alcohol drinkers, bushwhackers, swamp-waders, and jack pine savages, to read the following in a light and easy manner. Take nothing seriously and if you fail to find the joke, "Go ask the Sailor."

"WE GIRLS"

In the Forestry library
There is a clerk,
Who thinks that she knows
Just how to treat men.

She says that the Foresters
Just dote on the girls,
Their minds are just filled
With brown eyes and curls.

And if you should ask her
Of Eddie, old dear,
She'd say that he acts
Most awfully queer.

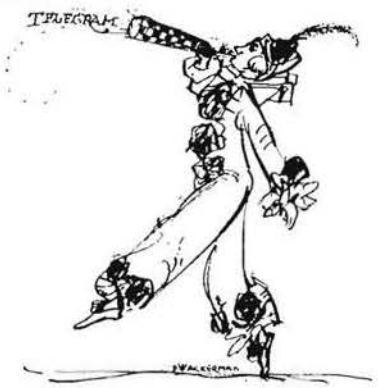
Now Nellie, she'd say,
Was the nerviest guy
You could tell he was mean
By the look in his eye.

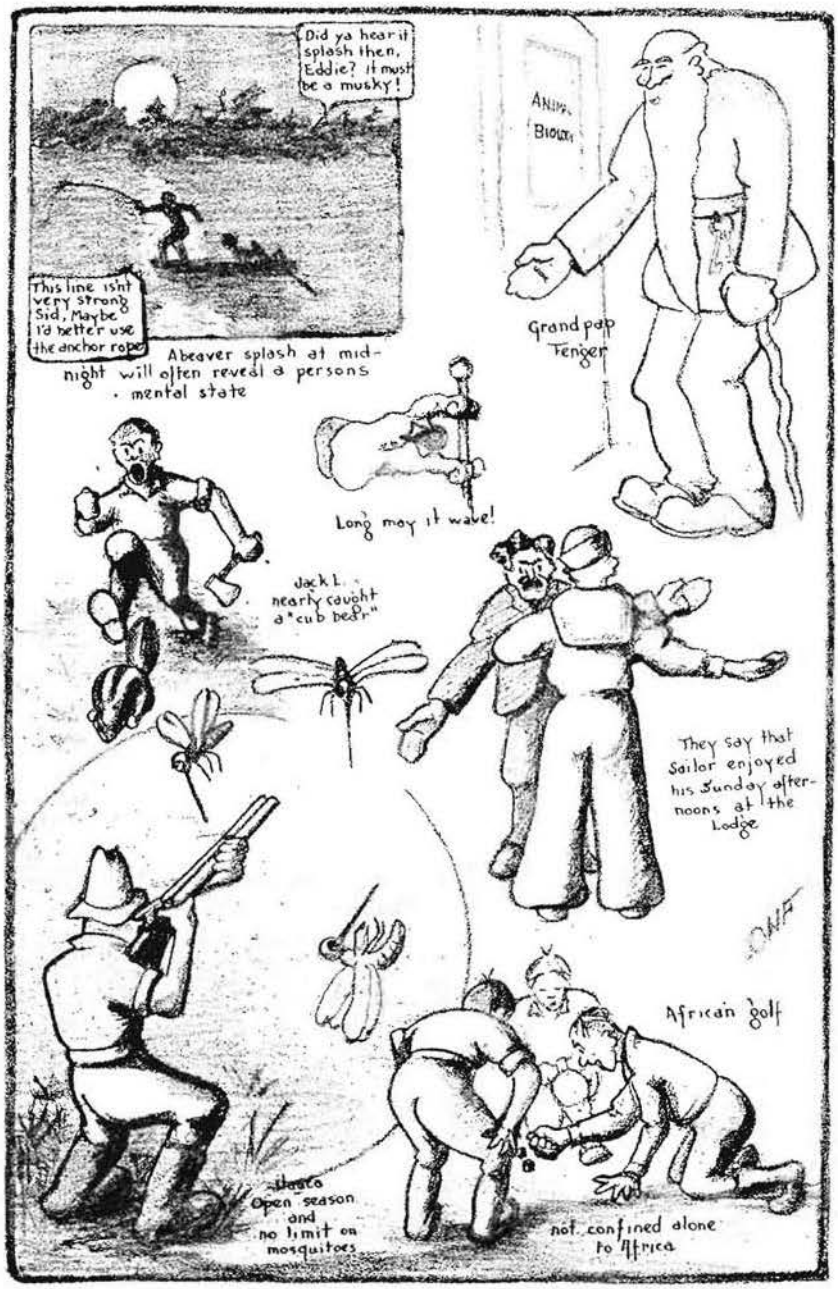
Just ask her of Andy—
"So important, Oh Min!"
You'd think that the college
Depended on him.

If one of the Foresters
Dare look for a book
Without asking her permit
They'll soon "get the hook."

Now surely I don't have
To tell you her name,
For throughout this college
Has spread "We Girls'" fame.

AUTHOR UNKNOWN




Did ya hear it splash then, Eddie? It must be a musky!
This line isht very strong Sid, Maybe I'd better use the anchor rope
Abeaver splash at midnight will often reveal a persons mental state
ANIM. BIOLOGY
Grand pap Teniger
Long may it wave!
Jack L. nearly cavght a "cub bear"
They say that Sailor enjoyed his Sunday afternoons at the Lodge
Africain golf
Open season and no limit on mosquitoes
not confined alone to Africa

THOSE FROSH

Frosh: "Willie, do you know anything about Chemistry?"
Willie: "No, what do you want to know?"
Frosh: "Never mind, I guess I know as much myself."

* * *

NO WONDER SHE WAS ARRESTED

News Item: Woman arrested for carrying a flask.

We wonder how it could be otherwise, after considering modern feminine attire.

* * *

OUT OF THE ORDINARY

News Item, November 21, 1921: Ole Flanagan and "Izzy" Sheehan both came to class on time today.

* * *

A NEW BOOK

I am informed from reliable sources, that "Sailor" Youngers has completed his latest work, "My Personal Opinion of the Jewish Race." It is now in the hands of the publishers, who predict a very complete set of asterisks, dashes, and exclamation points.

* * *

Swimming is our idea of clean sport.

* * *

The world is getting so crowded that probably the cows will begin to give condensed milk soon.

* * *

Did you ever see a mermaid?
No, but I've seen a woman-fish.

* * *

There is one thing in favor of wood alcohol drinking. It never becomes a habit.

* * *

Shorty Persons tells the world that he was in a class with one girl from 8:30 in the morning until 12:30 at night.

He also incidentally remarks that he has a cousin taking Biology. She has a fine figure, is of medium proportion, not a very classy dresser but neat—doesn't know the color of her eyes though. Claims he has intentions of taking her to a dance. We all know that cousin stuff!

* * *

Little drops of wood alcohol
Little grains of dope
Cause the natty floral design
"Gone above we hope."

* * *

THEY TELL THIS ON A FORESTER

Waitress: "We have cabbage, onions, letture, beets, peas, and—
Forester: "Don't trifle with me woman. What do you think I am—a rabbit?"

Here's to the breezes
That blow through the
treeses
And little girls' kneeses
And around their goleeshes
The little boy seeses
All that he pleases,
Oh gosh! by cheeses,
Why don't she freezes?

WILL WE EVER FORGET—YES AND NO

Itasca
J. P.'s Quizes
Mosquitoes
Fenger's grip
Hamie at the Comet
Racemosa
Dogwood bark
"Skipper's" Desolute
Racey at the piano
309-Men

* * *

Youngers (On the trip home from Madison): "They don't raise anything in this d—n State except pigs and Football players."

* * *

WOOD STRUCTURE

McCreery: "Light occupations waiting for the late wood to catch up to the early wood."

* * *

MERE SUGGESTION

We might say this for the girls, that if any of them are figuring on having to feed a Forester they had better take that Large Quantity Cookery course.

* * *

We noticed in the paper the other day that modern jazz music makes civilized Indians return to their former savage state.

Did you ever feel like climbing a tree after going to a "struggle?"

* * *

Jack Leffleman: "Hey, Eddie, where is the grease to fry this bacon in?"

GRANPAP FENGER

To a waitress in Cass Lake:
"Do you feed gentlemen here?"
"Yes, but we don't fill silos."

* * *

YES, YES, WE KNOW

We paddled down to the dam at the head of the Mississippi last spring and found an old derelict "river rat" as tender.

We: "Where is the drive now?"
He: "Oh, it's down by Miz Scrooney's place, I guess."
Two days later:
We: "How far down is the drive now?"
He: "It's down by Ol' Man Johnson's tonight."

Being thus assured of its whereabouts, we paddled back with light hearts.

* * *

We understand that Thayer is going in strong for Forest Protection, having taken a shotgun to the Park to shoot woodpeckers.

* * *

DENDROLOGY

Wentling: "Name five western conifers."
Willy: "Two Douglas Firs and three Redwoods."

* * *

WHY NOT?

With so many of these short courses for the Farmers and Home Makers the Foresters would like to suggest a similar course for Home Wreckers.—Instructor Hamie.

* * *

A DIRTY IRISH TRICK!

The man that stole Prof. Cheyney's suspenders during the Minstrel Show, two years ago, ought to be kicked by a mule, and we'd like to be the one to do it. He had to walk all the way home with his hands in his pockets.

* * *

1st Forester: "I feel like the wreck of the Hesperus."
2nd Forester: "Wassamatternow?"
1st Forester: "I'm on the rocks."

* * *

Great oaks from little acorns grow, but not if your acorns are wormy.

Moral: Be sure of your nut.

* * *

YES, ONE MIGHT

Biology Prof. lecturing on the use of the microscope: "You don't want to always use the high power. You wouldn't go to a theatre and sit in the front row and look through a pair of field glasses to see the show. You would see too much."

"3.1416"

A TRAGEDY OF ONE PIE, OF BLUEBERRY EXTRACTION

DRAMATIS PERSONAE

J-P		Professor J. P. Wentling
Ray		Raymond Pallmer
Mike	1919 Junior	Clyde M. Frudden
Louis	Corporation	Lloyd O. Grapp
Erick		Leyden N. Ericksen
Papa		Paul R. Palmer
Queen of Trays		Miss Lotta Wartz

Time—Not so very long ago.

Place—Cass Lake, Minn.; The Mausoleum of a Saloon; "Meals At All Hours."

Enter J-P and JUNIOR CORPORATION. They line up at counter, J-P's foot sadly missing something to rest upon. ERICK and PAPA arrange themselves ferninst each other.

Enter QUEEN OF TRAYS expectantly. touchingly arranging her coiffure.

QUEEN: Whadoyawant?

ALL: Hotroastbeefsandwichandaglassofmilk!

Exit QUEEN to preparation laboratory.

(Thirty minutes elapse)

Enter QUEEN bearing viands on a litter.

ALL: Guzzle, Guzzle.

(Thirty seconds elapse)

QUEEN: (To PAPA): Whatilyahavfordessert?

PAPA: I'll have some b-blu-blu-b-blu-blu-blu—etc.

QUEEN (To ERICK): Can you understand what he wants?

ERICK: Why yes, he'll have some b-blu-blu-b-blu-blu-blu—

J-P and CORPORATION: Chortle, chortle, chortle. (They pass away in paroxysms of laughter.)

CURTAIN

* * *

Due to the abundance of Mosquitoes, Brush, Swamps, Quizzes, 8:15's, and other trying conditions, we believe that there is a strong need for a course in Technical and Theoretical Profanity. While many are more or less familiar with the rudiments of the subject, they fail to attain that high degree of perfection and eloquence that allows one to proceed through very trying conditions with perfect calmness.

After some discussion, it was decided not to throw an All-U struggle at the Track this year

A FINISHED REPORT

After much research, Eddie has discovered why the grain of telephone poles is often twisted.

"The twisted grain is found only in poles with cross arms and wires on both sides of the pole. The current goes one way on one side of the pole and in the opposite direction on the other side. These currents exert a force sufficient to twist the pole and cause the twisted grain. I have climbed thousands of poles and am certain that this is the reason." —(Extract from Volume III on the subject.)

Every one isn't as fortunate as Peter the Snapper. Remember when a pretty girl fainted into his arms on the Inter-Campus car. The cause as yet has not been ascertained.

Some of our men here seem to be laying on annular rings at the rate of several per year.

Tourist (having difficulty with an European customs officer): "I always knew that the population of Europe was very dense, but these custom officials are the densest that I ever met."

FORESTERS?

Local ad: "Double room for rent, suitable for two gentlemen or four Ag students."

WE LIST THESE TWO "BONE HEAD" STUNTS

In 1916 Ike, Wack, Hank, and Papa pitched their tent on a poison ivy patch at Elk Lake.

The same year, the Freshman class was camped at La Salle spring. They woke up one morning to find Romayne Backas taking a bath in the spring. RED OWL.

Do you recall any more?

EASY

An eastern tourist was watching a ranger count the sheep leaving a forest.

Tourist: "How do you manage to count them when they go through so fast?"

Ranger: "Easy, jest count their laigs and divide by four."

Blage: "If it starts to rain wake me up because I can't sleep when it rains."

Chesebrough is responsible for this: That when a fish wants to scratch himself he swims in rough water.

It's not hard to understand why they relieved Gump from his job as lookout on a mountain top in Idaho after he had called up the ranger and told him that he heard a band playing somewhere.

Buck isn't such a bad fisherman, but when it comes to spearing suckers he just naturally dives in after them.

We wonder "What Hamic saw at the Comet"

Sweet was she
In name to me
Her flesh was white,
Her hair bedight
With leaves.

Her limbs were bare
Her trunk was "there."
Like a clinging vine
Was her body's twine—
That Sugar pine.

'19 Camp Log.

* * *

Joe: "Is it true that your father was a policeman?"
Shady: "No: but he used to go with them a lot."

FAMILIAR EXPRESSIONS

Sid: "Hells Bells!"

Leffleman: "This is getting to be serious, what we need is more money!"

"Sailor": "Horses!"

Gump Christy: "And then the shovel broke!"

Bryan: "Now that's right, ain't it? ain't it?"

"Porky": "Me and the little Gump."

Hamie: "You don't say!"

Chesebrough: "Words fail me!"

Sheehan: "Say you got a cigarette?"

Doc: "Gee, I didn't study this, did you?"

Thayer: "Berries, Berries!"

* * *

Ten thousand Swedes
Came thru the weeds
On the way to Minnehaha,
And the dust from the weeds
Made snuff for the Swedes
And they called it Copenhagen.

* * *

The "Chief" (during entertainment in sawmill): That reminds me of the joke—The teacher sent Mamie home with the complaint that she needed a bath. Mother sent Mamie back with the following note—"Mamie ain't no violet. If you'd do more teaching and less smelling we'd all get along better."

* * *

THEY CALLED HIM "SLIM"

This was culled from the back page of the Minneapolis Tribune. We thought that some of us might like to know a little of "Doc's" dark past.

Q. What is your full name?

A. The same as when not full. Edward Munroe Freeman.

Q. What is your business?

A. Solving the student's trouble with the faculty and the faculty's trouble with the student.

Q. What do you like most about it?

A. The constant contact with the freshness of youth. (Personally we never dared to get fresh with Doc.)

Q. If you could do it all over again, what business or profession would you choose?

A. Same thing.

Q. What was your nickname in school?

A. "Slim."

Q. Who is your favorite actress?

A. Julia Marlowe.

Q. What is your favorite sport or hobby?

A. Camping, canoeing, fishing, skating,—life in the woods and out of doors.

FORESTRY STUDENTS, 1921-22

FRESHMEN

Howard Blandin
Norman Boettcher
Charles Brookfield
L. Leslie Buck
Roy Chapman
G. Procter Cooper
Richard Delaney
Eugene Erickson
Ronald Erickson
Ambrose B. Everts
Bernard Forseth
Victor S. Jensen
John Kuenzel
Donald A. Nemec
Charles H. Racey
Nobel Shadduck
William W. Sherrard
Angus Stephan
Roy B. Thomson
Gale Whitchurch

JUNIORS

Philip Bryan
Robert Knight
Stanley Pagel
William Ritchie
Clarence Sunday
Charles Dockstader
Thorbern Fegraeus
Orcutt W. Frost
Hubert Hamilton
Otis McCreery
Arthur L. Nelson
Edwin Probstfield
Raymond Stevens
August Streinz
Carl Weswig
Paul W. Youngers
Louis J. Leffleman
Clifford Christopherson

SOPHOMORES

J. Will Adamson
Wilford Barrett
Harold Berggren
Harold Betzold
Arland Blage
D. Alton Christianson
Raymond Ecklund
Clement Flanagan
Chester Gay
Joseph Gordon
Leslie G. Henry
Dean Knutson
Truman Lotz
Victor Lynne
Herbert Maturen
Albin C. Nelson
William Peel
Hartley Pendergast
Maxon Pillow
Charles Pinney
Joseph Porzadek
Nelson Upton

SENIORS

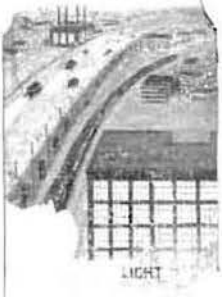
Otto W. Anderson
Alvin A. Anderson
Sidney S. Burton
Herbert Chesebrough
Ralph M. Nelson
John A. Sheehan
Burton Thayer
Floyd Tilden
Walter Wilson

UNCLASSED

Gunnar Fenger
Harold Ostergaard
Melville Roberts

WAR SPECIALS

Charles Gilman
E. W. Clark



A Gateway to Progress

There it stands—a simple forty-foot gateway but unlike any other in the entire world. Through it have come many of the engineering ideas that have made this an electrical America.

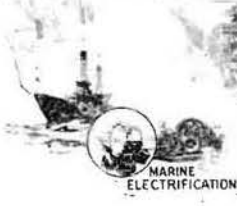
The story of electrical development begins in the Research Laboratories. Here the ruling spirit is one of knowledge—truth—rather than immediate practical results. In this manner are established new theories—tools for future use—which sooner or later find ready application.

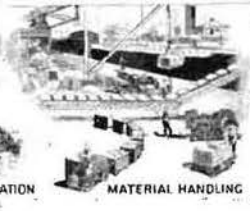
The great industries that cluster around Niagara Falls, the electrically driven battle ships, the trolley cars and electrified railways that carry millons, the household conveniences that have relieved women of drudgery, the labor-saving electricol tools of factories, all owe their existence, partly at least, to the co-ordinated efforts of the thousands who daily stream through this gateway.

General Electric Company

General Office Schenectady, N. Y.

95-486F





USEFUL DATA

A square acre is 208.71 feet on a side.

One hundred eighteen feet is approximately the radius of a circular acre, 83 feet of a half acre, and 59 feet of a quarter acre.

There are 160 square rods in an acre.

Area in square feet multiplied by .00003 gives area in acres.

Seasoning decreases the weight of wood by 30 to 50 per cent as a rule, and at the same time increases the strength by 50 to 100 per cent.

Weight of wood, thoroughly seasoned, per cubic foot is about as follows:

White pine, white spruce, balsam, fir, aspen	27 lbs.
Red Spruce, hemlock, poplar	30 lbs.
Pitch pine, Norway pine, black spruce, white maple	31-35 lbs.
White birch, red maple, tamarack, white ash, yellow birch, red oak	40-45 lbs.
Beech, sugar maple	about 48 lbs.
White oak, black birch	about 52 lbs.

RULES OF THUMB FOR FINDING APPROXIMATE VOLUME OF A TREE

1. (D. B. H.^{2}) x30=volume.
2. Subtract 60 from estimated diameter squared at middle of merchantable length of tree multiply by .3 and result is board feet of average log.
3. (D. B. H.) X 1/4 (D. B. H.) X number of log lengths equals the number of board feet contents.

TO WATERPROOF YOUR BOOTS

Melt together one pound of tallow, one-half ounce of neatsfoot oil, one ounce of resin, one-half ounce of lampblack, and one tablespoon of linseed oil.

* * *

NICE DOGGY

A friend may smile and bid you hail,
Yet wish you with the devil;
But when a good dog wag's his tail
You know he's on the level.

* * *

A man who gets kicked twice in the same place deserves it.

* * *

Whitchurch: "May I kiss your hands?"
She: "Yes, but why stoop so low?"

* * *

PERSONAL NOTE

The Editors want to take this opportunity to express their thanks to Mr. Probstfield for his assistance in gathering this material.

MAY I CALL ATTENTION TO THIS OLD ONE?

Tess: "Jack says my mouth is the prettiest he has ever seen."
Ed.: "Indeed! Well, I'll put mine up against it any time."

* * *

Sara was a shimmier,
She shimmied pretty keen.
The boys all liked to see her shake
Her wicked tambourine.

Empire Forester.

* * *

J. H. (in valuation): "Los Angeles County, California, is the largest producing county in the country."

Sid. (sotto voice): "Do you suppose they raise any Hell out there too?"

* * *

WHO WOULDN'T?

Bill Kenety sat on a hornets' nest.
%#9¾-O'&%/?@c"#$%.
"Gee, Wack, I'd have said the same thing if there had been a thousand ladies present."

* * *

Life is beginning to be worth while again, especially around the Campus on a windy day.

And along the same line, these short skirts are our idea of higher education.

* * *

A knot-bumper in town after a ten years' stay in the hills. (To his pal)—"These here styles in women's skirts are getting so that I can't look a girl in the eyes anymore."

THIS ANNUAL WAS PRINTED BY THE
ACME PRINTING & STATIONERY CO.
PROGRAMS, FRATERNITY STATIONERY, BOOKLETS, ETC.
DINSMORE 8189 411-413 FOURTEENTH AVE. S. E., MINNEAPOLIS

For Nice Things to Eat Ask

Michaud Brothers, Inc.
WHOLESALE GROCERS
255, 257, 259 East Fourth St. ST. PAUL, MINN.
Established 1872

DREBERT'S

Special Sandwich Shop

"LIKE FINDING YOUR APPETITE"

SUNDAY HOURS

for serving

BREAKFAST-TIME

8:30-12:00 o'clock noon

EVENING-TIME

5:30-8:00 o'clock

Shop ONE

1409-1411 4th Street S. E.

Shop TWO

Main Lobby Andrus Building

512 Nicollet Avenue

DREBERT'S

Special Sandwich Shop

"LIKE FINDING YOUR APPETITE"

THERE are two things you want of the wood you put on the outside of your house—long life and the ability to "stay put." In these respects there is a vast difference in the various woods on the market today.

Nature didn't make them all alike. She made some good for one use, and some for another. If you will select woods with regard to their fitness for particular uses, you will experience no disappointment.

White Pine

Three centuries of building in America have brought out the fact that no other wood so successfully withstands exposure to the weather as White Pine.

And it is more than just durable. It holds its place perfectly—even in the most delicate mouldings and carvings—without warping or splitting or opening at the joints.

It is this long and satisfactory service that makes White Pine the most economical wood for home-building.

"White Pine in Home Building"

is beautifully illustrated with old Colonial and Modern homes, full of valuable information and suggestions on home-building, and gives a short, concise statement of the merits of White Pine. Send for it now. There is no charge for it to prospective home-builders.

WHITE PINE BUREAU

Merchants Bank Building, St. Paul, Minn.

Order your books from

The Perine Book Co.

1411 University Ave. S. E.

Minneapolis

RECIPE FOR A RANGER

First you get a kettle and a fire that's hot,
And when everything is ready throw in the pot.
A doctor, a miner, of lawyers a few
And add one sheepherder and a cowboy or two.
Next add a surveyor and right after that
A man with some sense and a good diplomat:
At least one stone mason then give it a stir
And add to the mess a good carpenter.
A man who knows trees, and don't leave from the list
A telephone man and a fair botanist.
The next one that's added must be there that's a cinch.
It's the man who will stay when it comes to a pinch.
Add a man that will work and not stand and roar,
Who can do ten thousand things and just a few more.
Then boil it up well and skim off the scum,
And a Ranger you'll find is the residuum.

Campus Candy Shop

FINE HOME MADE CANDIES

Holiday Specialties **Salted Nuts**

1413 University Ave. S. E.

FISHING TACKLE CAMP EQUIPMENTS BOATS AND CANOES
Out of door Equipment of every kind
Established 1867

Kennedy Bros. Arms Co., Inc.

SPORTSMEN'S OUTFITTERS
GUNS AND SPORTING GOODS
GEORGE SHELTER TENTS OLD TOWN CANOES BICYCLES
Corner Minnesota and Fifth Streets St. Paul, Minn.

Send your films for developing and printing to

The Photo Art Shop

315 Fourteenth Ave. S. E.

Minneapolis

All work is done in our own shop and receives careful personal attention. We give special care to mail orders and request that you send us your vacation films, next summer, for developing and printing.

Sanitary Barber Shop

YOUR
PATRONAGE
SOLICITED

Hennepin Laundry Agency
Twenty-four Hour Service

PERCY T. ROSS, Prop. 2236 Carter Ave.

Get the

Forestry Club Orchestra

for Dances and Other Occasions
where peppy music is desired

Call Midway 2441 W. G. WILSON, Mgr.

HIGH GRADE
WOOLEN CLOTHING
for
OUTDOOR MEN
at the
NORTH STAR WOOLEN MILL COMPANY'S
RETAIL DEPARTMENT

Woolen Underwear
Mackinaw Coats
Woolen Hosiery
Sweaters
Flannel Overshirts
Camp Blankets

WRITE FOR PRICES

North Star Woolen Mill Co.

Third Avenue and Second Street South, Minneapolis, Minnesota

Mail orders filled from territory in vicinity of Twin Cities only

CAPS

"The Famous Rose Make"

A full line of Snappy Tweed Caps. We have one to suit you.

Get one early.

Grodnick's College Toggery

331 14th Ave. S. E.

The Campus Supply House

Run by Two College Men

Offers you

Music
Sheet Music and Phonograph Records

School Supplies
All Kinds

Magazines

Stationery

Novelties

1325 4th STREET S. E.

NEXT TO THE PARTHENON

Foresters

PATRONIZE OUR ADVERTIZERS

THE COMPLETE UNIVERSITY BOOK STORE

We carry a complete line of everything you need in your collegiate work.

You can always find what you want in

Text Books, Note Books, Fountain Pens, etc.

AT

THE CO-OP

1401 University Ave. S. E.

Mail orders filled from territory in vicinity of Twin Cities only

C. A. B. Co.

MANUFACTURING JEWELERS

Fraternity Pins, Rings, and Class Pins a Specialty

Carved Wedding Rings

Fancy White Gold Mountings

Third Floor Northwestern Bldg. **Fourth and Hennepin**

A. A. Manke

2262 Como Ave. West ST. PAUL, MINN.

DRY GOODS — NOTIONS

LADIES', MEN'S AND CHILDREN'S FURNISHING GOODS

CHILDREN'S WASH TOGS

YOUR DRUGGIST
IS MORE THAN A MERCHANT

Chas. H. Evenson

ST. ANTHONY PARK STATE BANK

Corner Como and Carter Aves.

"Your Community Bank"

W. S. PALMER

Your Community Jeweler

2276½ Como Ave.

Repairing and Engraving

Class of '06

Grant's Hardware

ELECTRIC WASHING MACHINES
ELECTRIC SWEEPERS
ELECTRIC IRONS

2278 Como Avenue ST. PAUL, MINN.